Vol. 135 No. 2 August, 1931 Price 25c

AMERICAN GAS JOURNAL

Established 1855 Pioneer of the Gas Industry

Manufactured and Natural Gas

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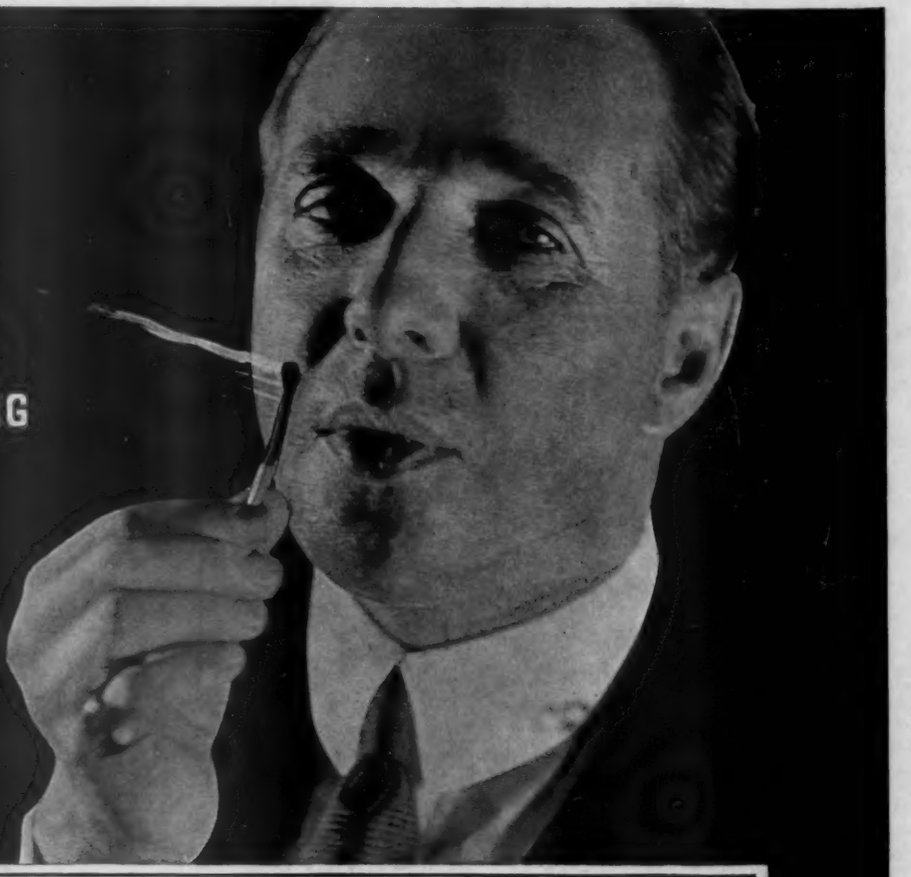
Light it IN FALL
Forget it UNTIL SPRING



A SLOGAN with an irresistible appeal. It's the headline of the first of a series of advertisements on the Estate Gas Heatrola which will appear in The Saturday Evening Post this Fall, all telling the story of Automatic Gas Heat at a Price Everyone Can Afford! Here is a section of the house-heating market which should not be overlooked in making your campaign plans. The Estate Stove Company, Hamilton, Ohio, pioneer builders of gas-heating appliances and sole manufacturers of the Gas Heatrola, will be glad to send full information to any interested company.

LET'S BE . . *Sensible* . ABOUT THIS METER . . . BUSINESS

EMCO Large Capacity Meters have ONE PIECE BODY CASTINGS, therefore,

1. freedom from leaks.
2. no gasket troubles.
3. 66% less bolts and cap screws than other makes.
4. accessible in any installation.
5. repairs and inspections made with meter in the line.

EMCO No. 4 with an EMCO Combined Record Gage.

Three sizes, for maximum pressure up to 500 lbs.

No. 2½, 1,800 cu. ft.

No. 3, 2,500 cu. ft.

No. 4, 5,000 cu. ft.

capacities at 2" absorption

PITTSBURGH EQUITABLE METER CO.
MAIN OFFICE AND FACTORIES
PITTSBURGH, PA.

EMCO METERS AND REGULATORS

AMERICAN
GAS JOURNAL
Established 1863 — *Pioneer of the Gas Industry*

Manufactured and Natural Gas

Executive and Editorial Offices, 53 Park Place, New York City
Copyrighted 1931 American Gas Journal

S. G. KRAKE, *President and Treasurer* — A. M. GLEASON, *Secretary*

H. M. RILEY, *Editor*

R. S. MCBRIDE, *Consulting Editor*, Washington, D. C.

Vol. 135, No. 2 — August, 1931 — Whole Number 3692

TABLE OF CONTENTS

This Attribute Never Changes 23
Safety Cooperation 24
Know Your Valves 24
In Dog Days Grouches Are in Season .. 24
New York Commission Sets Rate Precedent 24
Air Conditioning—S. Procter Rodgers .. 25
Natural Gas Possibilities in Michigan—R. A. Smith 29
Physical Characteristics of Arc Welded Joints in Pipe Lines—J. F. Lincoln .. 31
A Discussion of Distribution System Pressures—H. H. Gracie 33
The Trenching Machine—An Important Factor in Gas Distribution—Henry M. Riley 35
Value of Indicating the Gas Compressor—Rudolf Ulrich 38
Every Now and Again this subject Crops Out 40
What's In a Name—Justin McMurray Kennedy 40
Calculating Gas Heating Value from Analysis—J. R. Branham 42
Checker Brick in Water Gas Sets—Geo. W. Parker 44
Industrial Furnaces for Gas—Lawrence E. Biemiller 47
American Gas Merchandising Almanack 49
Building a Plan 50
Ambitious Campaign Begins 51
Home Service Activities—A. Freeburg .. 52
Speaking of Advertising 53
Here's How 54
Contest Paves Way to Neater Display Rooms—Rodger K. Tenney 59
The Legal Side of our Industry—Leo T. Parker 60
Successful Third Annual Domestic Gas Appliance Course 62
Michigan Association Discusses Natural Gas and Other Live Topics 64
Book Review 64
Equipment News 65
News of the Gas Industry 68
Personals 74
Trade News 78

INDEX TO ADVERTISERS, PAGE 105

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681 Market St., San Francisco, Cal.

F. P. CURLEY, *Service Department,*
53 Park Place, New York

The Builders of Stacey Holders for Over 80 Years

ANNOUNCEMENT TO THE INDUSTRY

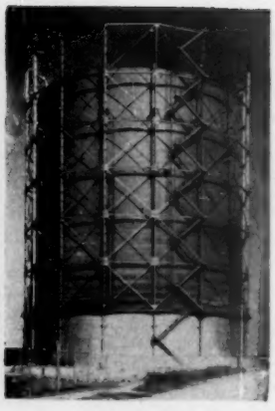
In order that the present status of The Stacey Manufacturing Company may be clearly understood, it is desired to make the following announcement to the trade:

Due to a controversy between certain stockholding interests, a suit was instituted for the appointment of a Receiver to operate the business of the Company until this matter could be definitely determined.

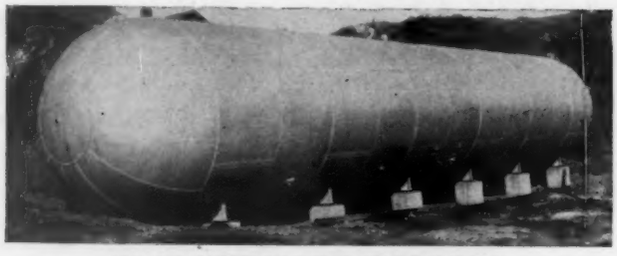
On July 14th, 1931, Judge Stanley Matthews of the Court of Common Pleas of Hamilton County, Ohio, appointed Mr. W. E. Keplinger as Receiver and issued an order providing that The Stacey Manufacturing Company continue as a going concern.

There is no question of finances involved as the Company is in a particularly strong financial position.

We sincerely solicit your business as in the past and assure you any contracts accepted by this Company will be carried out to completion to your entire satisfaction, as has been our policy during the past eighty years.



LOW PRESSURE HOLDERS



HIGH PRESSURE HOLDERS

THE STACEY MANUFACTURING CO.

ENGINEERS AND BUILDERS

W. E. KEPLINGER, RECEIVER

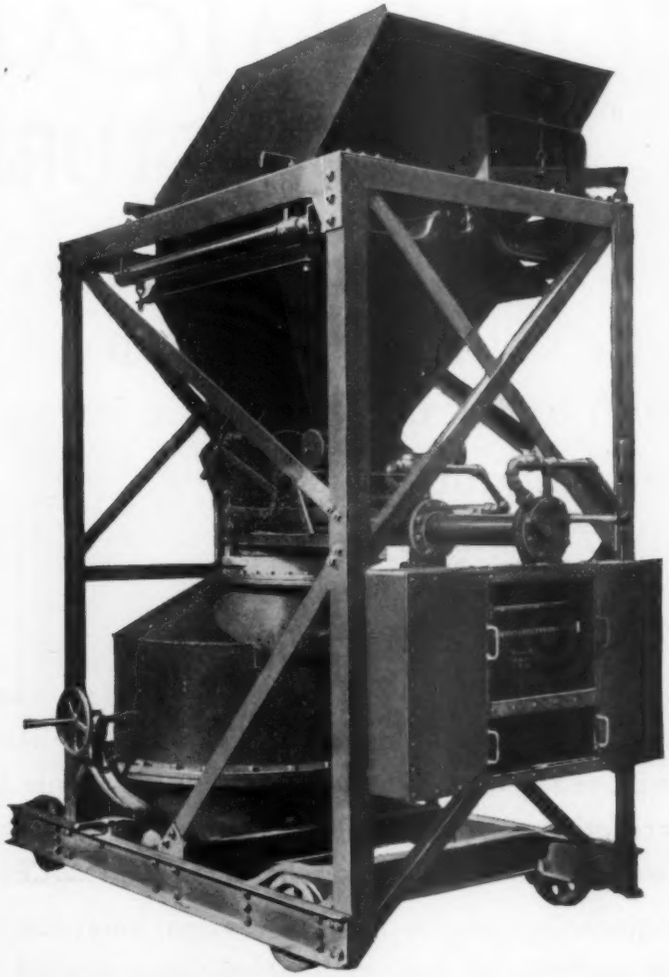
CINCINNATI, OHIO

NEW YORK OFFICE
52 Vanderbilt Avenue

STACEY SINCE 1851

YOU NEED THIS SEMET-SOLVAY CHARGING MACHINE IN YOUR PLANT

The Semet-Solvay Charging Machine will pay for itself in—



Improved firing conditions.

Increased capacity.

Complete elimination of generator house fuel handling labor.

Uniform fuel charging, controlled and recorded by a dependable weighing mechanism.

Elimination of spillage and dirt around the charging hole.

THE SEMET-SOLVAY CHARGING MACHINE can be fitted to any water gas or blue gas generator of sufficient size to warrant mechanical fueling.

We would appreciate an opportunity to study, without obligation to you, the value of a Semet-Solvay Charging Machine for your plant.

SEMET-SOLVAY ENGINEERING CORPORATION

40 Rector Street New York, N. Y.

BUTANE
"PLUS"

SIX FACTORS FOR ECONOMICAL GAS MANUFACTURE

1. Low plant investment
2. Complete automatic operation
3. Minimum labor costs
4. Low maintenance costs
5. Flexibility to demands
6. 100% thermal efficiency

Economy means greater profits—and these six factors explain why BUTANE and other Liquefied Petroleum Gases are constantly being more widely employed by the Gas Industry—in new gas plants, for enrichment, for recarburetion, and for the conversion of uneconomical coal and water gas sets to the modern PHILFUELS PROCESS.

Competent engineering service in plant design, selection of equipment and methods of operation—experience gained in pioneering the utilization of Liquefied Petroleum Gases—is available to Philfuels customers.

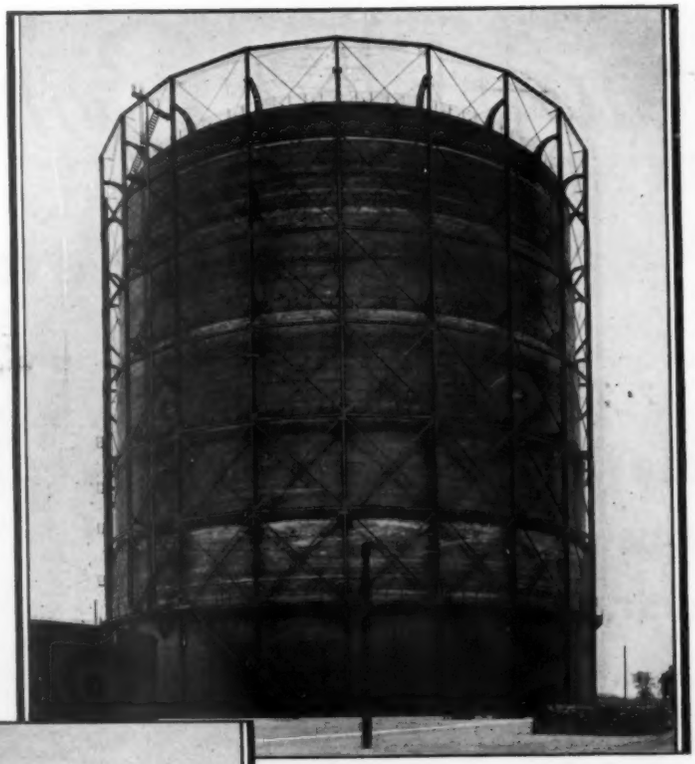
Gas Manufacturing Division

PHILFUELS COMPANY

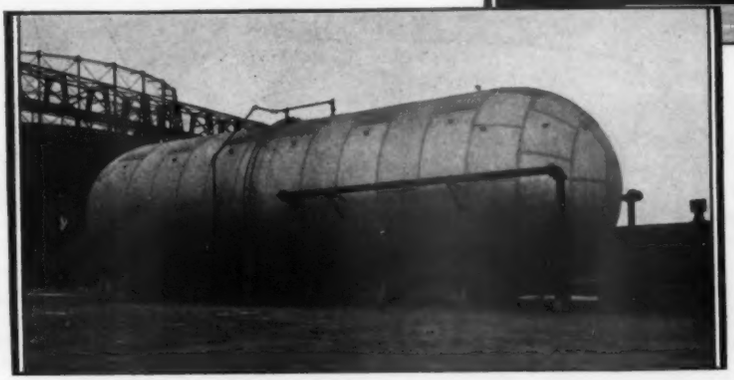
(Subsidiary of Phillips Petroleum Company)

7-101 GENERAL MOTORS BUILDING

DETROIT - - - - - MICHIGAN



The NEXT DECADE'S MOST IMPORTANT FEATURE IS NOW IN OUR HOLDERS



In the next ten years the manufacturers that succeed in gaining and holding leadership in their fields are certain to be those who demonstrate their ability to build into their product both low first cost and minimum upkeep.

In achieving minimum upkeep we are standing fast by our policy of building only for quality, giving to each operation a degree of care from which economy in maintenance can and will result.

Meanwhile, our engineering staff continues to find, within our own organization, improved practices by which quality work is produced at minimum first cost. Purchasers of our Holders in the next decade will gain a double economy. Purchasers are gaining both now.

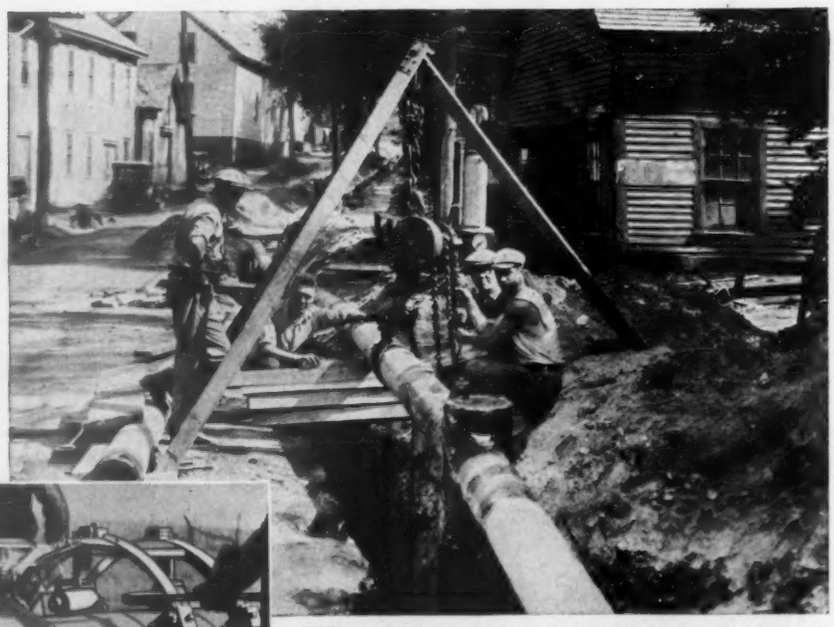
Manufacturers of GAS HOLDERS and other major equipment units for the GAS INDUSTRY.

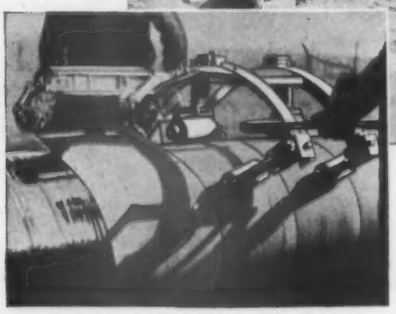
CRUSE-KEMPER CO.

AMBLER, PA.

Bury your Corrosion Worries—WITH THE PIPE LINE

Here is security against moisture penetration...Soil stress . . . Electro-chemical action





Mill-wrapped pipe being lowered into trench. In mill-wrapping, felts can be applied under the most advantageous conditions with no chance of moisture getting in to spoil the job.

(At Left) **Five to ten thousand feet per day of 24" Dresser coupled line can be wrapped in the field with the Johns-Manville W-K-M saddle-type machine.**

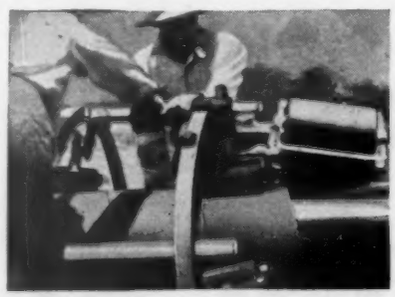
OWNERS of more than 10,000 miles of pipe lines have obtained security against corrosion by incorporating a wrapping of J-M Asbestos Pipe Line Felts in their pipe protection.

A wrapping of J-M Asbestos Pipe Line Felts adds to the waterproofing provided by the bitumen coating and successfully combats electrolytic and galvanic actions. It also distributes clod pressure and takes the sheer and pull of soil action, providing an effective armor of lasting protection.

This lasting protection afforded by the J-M Pipe Line Felt Wrapper is obtained at a fraction of the cost of reconditioning.

Johns-Manville Asbestos Pipe Line Felts can be applied bonded or unbonded—by hand or by machine—in the mill, in the yard or in the field.

Johns-Manville engineers are especially qualified to discuss with you the economy of properly protecting your pipe lines. Address our local office or Johns-Manville, 292 Madison Ave., New York.



Wrapping over hot coating on a 10" welded line with Johns-Manville W-K-M rotary-type field machine.

Johns-Manville

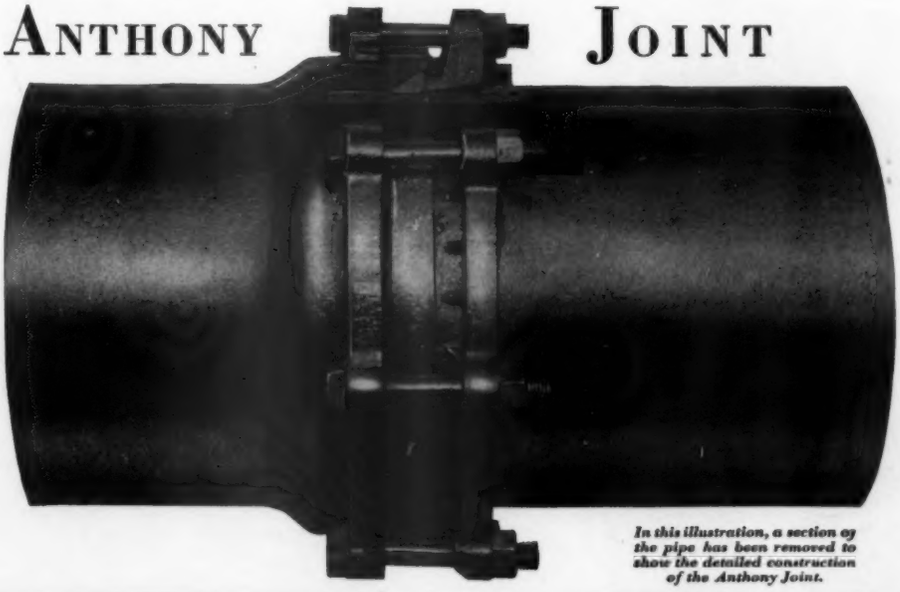
JOHNS-MANVILLE JM PRODUCTS

Pipe Line Felts

For FAST *assembly . . .*

the

ANTHONY JOINT



In this illustration, a section of the pipe has been removed to show the detailed construction of the Anthony Joint.

only 3 easy operations

No longer do you have to bother with troublesome and exacting details to assure the tightness of a joint under high gas pressures. The Anthony Joint eliminates unnecessary delay, thus bringing about an appreciable saving in installation costs.

With the Anthony Joint, you merely put *one* gasket in place and bolt two rings together. Just three easy operations and there's a joint which will withstand high gas pressures 24 hours out of every day—without the sign of a leak.

The Anthony Joint allows for a surprising amount of deflection too. By using this joint, you can lay an absolutely leak-proof line in steep or rolling country.

The New Anthony Joint is offered in either deLavaud centrifugally cast pipe or in pit cast pipe and fittings. All rings, bolts and gaskets are interchangeable.

Of special interest is the fact that Anthony Joint bends, tees and other fittings can also be used with plain end pipe. These Anthony Joint fittings enable the contractor to make sure of the tightness of the important terminal points of his line. Ask us for complete information regarding the many advantages which this new joint offers.

United States Pipe and Foundry Co., Burlington, N. J.

Sales Offices: New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

Our pipe bears the "Q-Check" trademark of The Cast Iron Pipe Research Association

Tight, Flexible, Permanent
Dresser Couplings are bottle-tight, highly flexible, and adapted for any kind of plain-end pipe. With special gaskets where conditions require it, Dresser-Coupled joints become not the weakest but the strongest and most durable parts of a gas line.
S.R. DRESSER MFG. COMPANY
BRADFORD, PENNA.
Dresser Couplings Dominate

MAINTAIN UNIFORM PRESSURE

Stacey "Bullet" at Waukesha, Wisconsin. Capacity 354,300 Cubic Feet. Pressures 60-0. Dimensions 25' x 185' over all.

STACEY-KLONNE DRY HOLDERS	SCRUBBERS PURIFIERS
GAS HOLDERS "BULLETS" TANKS	PENSTOCKS STAND PIPES CONDENSERS

AND EXPAND SERVICE

PRESSURE storage in Stacey "Bullets" provides an economical and effective means of extending gas service to outlying districts or for maintaining uniform pressures in congested districts where peak periods draw heavily on the mains.

By filling "Bullet" pressure holders during off-peak periods, operating costs are reduced, uniform pressures maintained and service extended without enlarging the mains or constructing additional plant facilities. Storage can be located where it is most effective.

Write our nearest office for data and estimate costs on the storage you contemplate.

STACEY GAS CONSTRUCTION DIVISION

INTERNATIONAL-STACEY CORPORATION

5535 Carthage Pike
CINCINNATI, OHIO

420 Lexington Avenue New York City	20 North Wacker Drive Chicago, Illinois	877 Michigan Avenue Columbus, Ohio	1309 Aviation Bldg. Fort Worth, Texas	Subway Terminal Building Los Angeles, California

THE BEST GAS

Lux Material

Bulk (unmixed)

Shipments from

Boston
New York
Philadelphia
Baltimore
Mobile
New Orleans

CHICAGO OFFICE:
343 SO. DEARBORN ST.
PHILADELPHIA OFFICE:
2767 GAUL ST.

THE ALPHA -
192 FRONT STREE

S PURIFIER!

Lux-Sponge
THE PERFECT READY MIXED OXIDE

Shipments from our own
Lux Sponge Plants
At the service of the Gas Industry

For the East: Shipments from Philadelphia
For the West: Shipments from Chicago

LUX
ERIAL

"LUXIT-H·T·"
Cement (Dry)

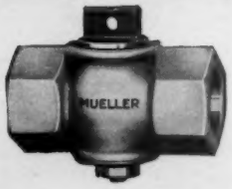
For Patching Hot Retorts, Refractory Linings, etc. Shipped in 110 lb. bags.

Order Sample
Shipment — To-day!

LUX COMPANY, INC.
E, NEW YORK CITY, N·Y·

Like a finger in the dyke

this extra ¾" puts *extra* strength



where strain is greatest

MUELLER
G-11094 Recess
End Gas Stop

MUELLER gas stops are made in sizes and styles to suit every requirement. Your request will bring complete information or we will gladly make recommendations for specific installation problems.

ONCE upon a time a little Dutch boy noticed a trickle of water coming from a dyke. In a few hours his beloved Holland would have been flooded—with loss of life and property. Thinking quickly, he plunged a finger into the opening and called for help, and Holland was saved.

Now the MUELLER Company has provided against those dangerous leaks in MUELLER G-11094 Recess End Gas Stop. This iron body stop (both round and straightway) has "recess ends" which extend nearly three-quarters of an inch beyond the threads, providing a plentiful *margin of safety where strain is greatest—where strength is vital!*

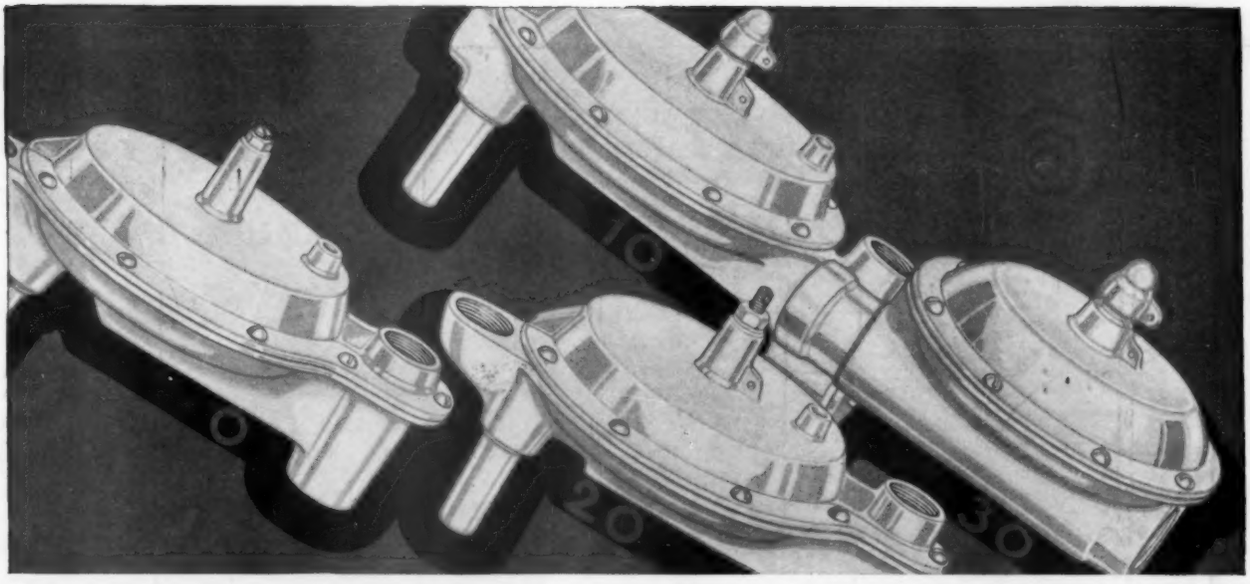
You'll find all characteristic MUELLER features in these stops —iron body and red brass key—inlet and outlet threaded at same time, permitting straight line connections—"hot process" galvanizing for underground protection. Made in sizes ¾" to 2" inclusive.

MUELLER CO. (Established 1857), *Factory:* Decatur, Illinois; *Branches:* New York, Dallas, Atlanta, San Francisco, Los Angeles, Chicago. *Canadian Factory:* MUELLER, Limited, Sarnia.

MUELLER

Trade-Mark Reg. U. S. Pat. Off.

Dependable Gas Brass Goods Since 1857



EACH MODEL FILLS A SPECIFIC NEED

REYNOLDS PRODUCTS

for all kinds of Pressure Reductions —for either Artificial or Natural Gas.

GOVERNORS—
- Intermediate Pressure
- Triple Outlet
- Holder
- Toggle Type Street

REGULATORS—
- High Pressure Service
- Low Pressure Service
- Intermediate Pressure
- High Pressure Line
- Single and Double District Station

VALVES—
- Automatic Quick Closing
- Anti-Vacuum
- Relief

SEALS—
- Mercury
- Dead Weight

GAS CONTROL SINCE 1892

• You take nothing for granted when you use REYNOLDS Service Regulators. Each model in its specific use is engineered to give efficient performance from the minimum to the maximum load capacity . . . REYNOLDS Four Service Regulators—0 • 10 • 20 • 30 (Model 30 offered in seven styles)—are built to meet the individual requirements of the user. Write REYNOLDS for catalog or definite details. Also, remember that REYNOLDS engineers are always ready to co-operate with you on any of your Gas Control problems.

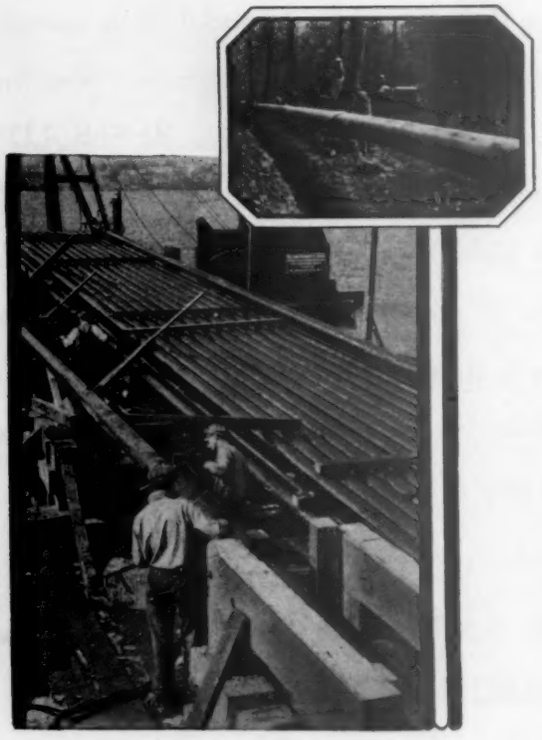
REYNOLDS GAS REGULATOR CO.
ANDERSON, INDIANA, U. S. A.

BRANCH OFFICES { 422 DWIGHT BUILDING, KANSAS CITY, MISSOURI
2ND UNIT SANTA FE BUILDING, DALLAS, TEXAS

REPRESENTATIVES { EASTERN SERVICE CO., BOSTON, MASSACHUSETTS
F. E. NEWBERRY, AVON, NEW JERSEY

OXY-ACETYLENE WELDING

Predominates Pipe Line Construction . . .



MORE miles of trunk pipe lines were oxy-acetylene welded during 1930 than in any previous year . . . and, more miles were oxy-acetylene welded last year than were joined by all other means combined!

In every climate, under every topographical condition, oxy-acetylene welding has proved to be the ideal method of joining pipe lines. Oxwelded lines are particularly satisfactory from the standpoints of installation, maintenance and operating costs, and operating efficiency. They are permanently tight. Transportation of oil, gas or gasoline through oxwelded lines continues year after year without interruption.

Linde Process Service, applied in laying thousands of miles of pipe every year, has pioneered many advances in pipe welding. It effectively supplements the work of pipe line contractors in obtaining maximum speed, economy and dependability. Every user of Linde Oxygen is privileged to call upon this service at any time for assistance or advice. Some of the many possibilities of oxy-acetylene welding under Linde Process Service may be worthy of your immediate investigation, too.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants UCC 627 Warehouse Stocks

IN CANADA, DOMINION OXYGEN COMPANY, LTD., TORONTO

District Offices

Atlanta	Detroit	New York
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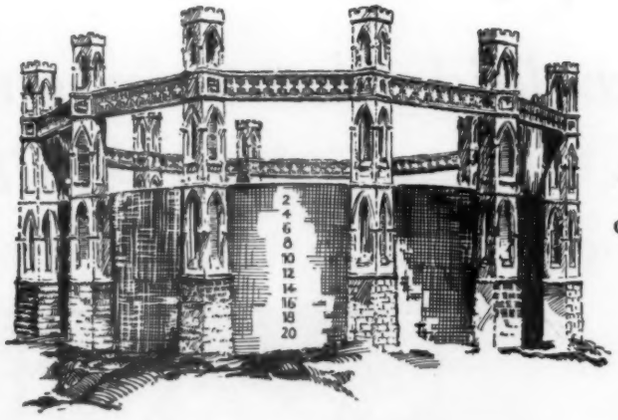
Birmingham	Houston	Pittsburgh
Boston	Indianapolis	St. Louis
Buffalo	Kansas City	Salt Lake City
Chicago	Los Angeles	San Francisco
Cleveland	Milwaukee	Seattle
Denver	Minneapolis	Tulsa
	New Orleans	

LINDE OXYGEN · PREST-O-LITE ACETYLENE · OXWELD APPARATUS AND SUPPLIES · UNION CARBIDE



Gas Holder erected
in 1853
Capacity 1,800,000 ft.

METERS AND METER MAKERS

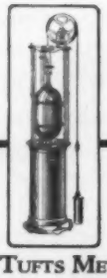
that have grown up with the industry

For 96 years Gas Meters from American Meter Company plants have been the key factor in recording growth of gas sales to the consumer.

In developing these meters the makers have worked hand in hand with the Gas Industry. They have unfailingly met new conditions and new requirements with equipment of proved performance.

Such a policy has brought its own reward — confidence concretely expressed in millions of installations covering all phases of gas measurement.

American Meter Company factories are staffed by men who have grown up with the industry. Backed by unexcelled facilities for research and service they are ever on the alert to meet gas measurement requirements.



JOHN J. GRIFFIN & CO. Est. 1859 | HELME & MCILHENNY Est. 1848 | D. MCDONALD & CO Est. 1855 | METRIC METAL WORKS Est. 1888

MARYLAND METER WORKS Est. 1866 | NATH. TUFTS METER WORKS Est. 1860 | PACIFIC METER WORKS Est. 1901

In 1854 . . Providence laid Cast Iron gas mains which are still in service

BUSINESS communications were written and copied with a quill pen and the letter-press when Providence laid her first cast iron gas mains. Imagine trying to do business today without typewriters or telephones!

Yet those original cast iron mains laid more than three score and ten years ago are still serving the City of Providence and meeting modern conditions. Cast iron pipe is probably the only example of engineering material used in those times which is serving satisfactorily under the radically changed conditions of today.

The quality of the cast iron pipe laid 80, 90 and 100 years ago and still serving many of our older cities, was obviously remarkable. But the cast iron pipe industry, in common with office appliances, has progressed. Today's cast iron pipe benefits from scientific laboratory control and testing devices that were unknown three generations ago. Higher quality, greater uniformity of quality and the development of efficient mechanical joints for high-pressure distribution, have kept cast iron pipe in step with the modern demands of the gas industry.

Since the long life and low maintenance records of *old-time* pipe are so remarkable, is it any wonder that engineers prefer to specify *modern, improved* cast iron pipe for gas distribution systems today?

No wonder Engineers specify Cast Iron gas mains for modern conditions

Engineers, contractors and city officials desiring information on the advantages of specifying cast iron pipe for gas, water, sewers, road culverts or for industrial needs are invited to write to Thomas F. Wolfe, Research Engineer, The Cast Iron Pipe Research Association, 309 Peoples Gas Building, Chicago, Ill.

Cast iron pipe bearing the "Q-check" trademark is obtainable from the following leading pipe founders: Alabama Pipe Company, Anniston, Ala.; American Cast Iron Pipe Company, Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Avenue, Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Company, Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe and Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Corporation, 11 Broadway, New York.

Efficient mechanical joints for cast iron gas mains are now in use and obtainable for high-pressure gas distribution.

Reg. Trade Mark

CAST Q IRON

The "Q-check" symbol shown above has been adopted as the trademark of The Cast Iron Pipe Research Association.

CAST IRON PIPE

Darling Valves Are Truly Economical

You may pay a little more for Darlings than ordinary valves, but actually you are getting a bargain—the most for your money.

Although you find them no bigger, or prettier, or heavier than others at the same price, you will learn after getting years of trouble-free service that Darlings have a lot more *in* them in the shape of easy operation, extraordinary long life, and fewer repairs.

The hows and whys of Darling's superiority are well explained in our Bulletins. We will gladly send them upon request. Write the nearest branch office today.

Darling Valve & Mfg. Co.

Williamsport, Penna.

New York **Oklahoma City** **Houston**

DARLING
GATE VALVES

Stepping along

WITH McWANE

McWANE Cast Iron Pipe speeds and simplifies your pipe-laying. It is the ideal combination of long lengths and modern weights with all the advantages of being SAND CAST. It handles fast. Cutting, tapping, lowering into trench with the minimum of time and trouble when you lay McWANE.

McWane Pipe averages over 30,000 lbs. tensile and 2,600 lbs. transverse strength—far in excess of A.W.W.A. requirements. It is resilient, bends before it breaks, stands up under hard service.

And while McWane Pipe is sold either with or without the famous factory made gas joints, when you order *them* with your pipe, then indeed the trencher has to hustle to keep ahead of your pipe-layers!

SMALLEST SIZES

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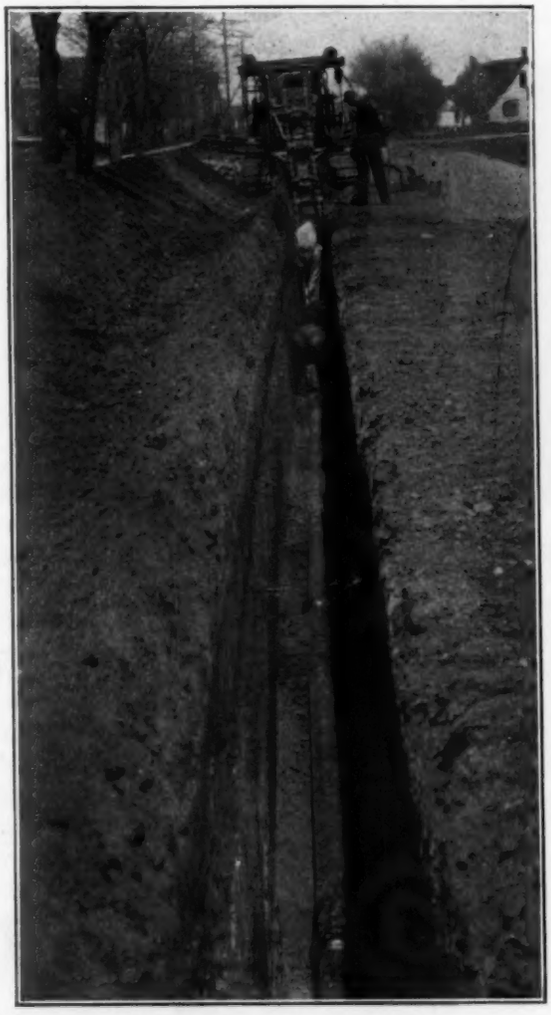

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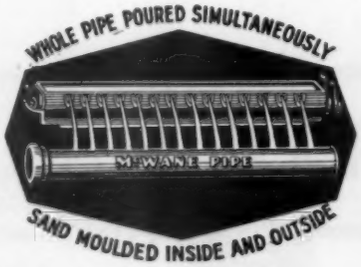

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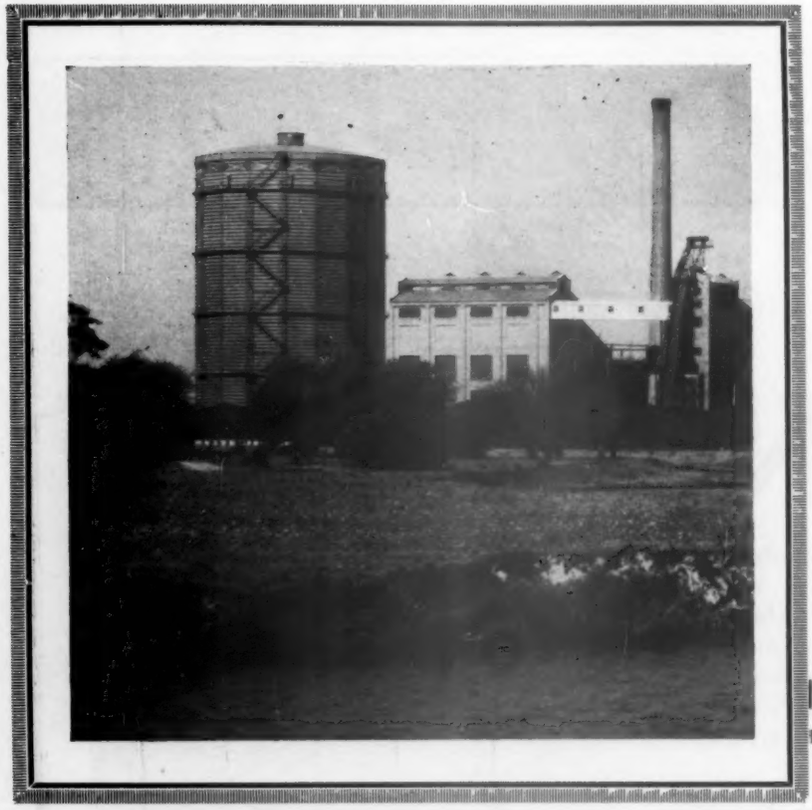

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AMERICAN
GAS JOURNAL
Established 1859 Pioneer of the Gas Industry
Manufactured and Natural Gas

HENRY M. RILEY, *Editor*

This Attribute NEVER Changes

EVERY DECADE or so we Americans anchor our business craft to some abstract idea or catch-word with all the fervor of a native African in his worship of teeth, old bones, mummified heads of his enemies and other such ridiculous objects. Thus, twenty years ago there was much orating anent the word "efficiency"; then, about 1920, we had shifted our affections to "service" and now we blatantly thunder forth our battle cry of "change," or, as many insipidly put it, "things are in a state of flux." Speaking in a business sense, one is almost forced to conclude that we are blind worshippers of a fetish and that, in our silly obeisance, we have overlooked the prime, *never changing* attribute which is so necessary to success. We refer to *work*—real muscular effort; moving about; literally sweating; getting things accomplished via the increased blood pressure route without "passing the buck" and merely dreaming that it would be fine to do this or that.

In the present masterpiece of business confusion, with its horrendous coterie of doctors who claim ability to "see around the corner," and Pollyanna tub thumpers, we have kicked and buffeted the idea of anybody indulging in real work into such a state of paralysis that one despairs of its ever being able to function normally again. The dominating thought leading up to the existing situation seems to have been, get the money—preferably, without the expenditure of work.

Although only in a relatively small degree, our own gas industry has felt the backwash of lack of business. Even so, many of the industry's employees are doubtless concerned as to the stability of their own particular jobs. Let them abolish any such disconcerting reflections. Let them team up their careers with hard work and by so doing they will become increasingly indispensable to an industry which itself has built its success on the gospel of hard work. Study the responsibilities of your job and when yuo have an idea roll up your sleeves and pitch in; and don't get anyone else to help you except in those cases where assistance is necessary. Do not delegate to someone else, work which you should do yourself. Meanwhile let the world at large know that we are on the job. Tell them we have a product which they need. Hard work is the answer.

August
1931

As We See It

Safety Cooperation

AT THIS SEASON the country has its usual large list of drownings, which is made up of young people for the most part. In the resuscitation of many of those who have been almost drowned the Prone Pressure method has done a great piece of work. Indeed, it is probably correct to say that gas companies were the pioneers in inaugurating this system of saving lives, since the procedure is identical, whether used in cases of near drowning, partial electrocution or gas asphyxiation. In other words, gas men as a general thing are experts in applying the Prone Pressure method of life saving.

There are still remaining some five or so weeks of outdoor life for the juveniles; five or so more weeks for additional drownings to occur. Perhaps it might be a public spirited gesture for gas companies to include with their monthly bills a small leaflet calling attention to the appalling number of drownings each year and also detailing the modus operandi in proceeding with the Prone Pressure method.

As a matter of fact, it might well be in order for the local gas company to detail a man to visit Boy Scout meetings during the year and demonstrate this method of resuscitation. It goes without saying that such periodic visits would be enthusiastically welcomed. We would assuredly build splendid good will by such action and render a real service to the community.

Know Your Valves

ANYONE WHO HAS had the experience of having to dash madly through the plant and hastily turn a valve to take care of some emergency will readily recognize the value of knowing his valves with all the intimacy possible. And now that the dull season is on, it might be a good time to make a valve survey, not only of the plant, but in other places where valves might have to be operated in emergency.

Mr. Gas Man, do you have an adequate and up-to-date map of your gas plant showing the size and location of the valves? Are they in working order and how do you know they are? Are your purifier house valves each labelled with a tag? Is there a handy sheet telling how many turns to close the valve and other information? How do you know your foremen and others are familiar with the location of valves and what they control? Do you ever get them into the office at odd times and propound an hypothetical emergency and ask them what valves they would operate and why? The same questions apply to the compressor station and the pipe line, to mention nothing of the distribution system.

Valves are always installed for a specific purpose. Accordingly, they should be adequately mapped and indicated and their characteristics and control features understood.

In Dog Days Grouches Are in Season

UNFORTUNATELY, the summer season puts an unusual strain on the public relations of utility companies. Everyone suffering from heat and humidity becomes touchy, both customers and staff people. Relations normally easy and pleasant often become seriously disturbed.

The problems resulting from this situation can be eased greatly both by leniency, without slackness, of management, and by the exercise of self-restraint and good sense on the part of all company employees. Don't forget that the other fellow too may have been kept awake last night because his bedroom was too hot for restful sleep. Give him the benefit of the doubt. And above all things, don't argue. Leave controversial questions to be settled after vacations are over and everybody is refreshed by the return of more temperate weather, whenever such postponement will not really do any harm.

New York Commission Sets Rate Precedent

THE GAS COMPANIES of Brooklyn have received a precedent making ruling on their rate schedules, recently reviewed by the New York State Public Service Commission. In these schedules the Commission definitely recognizes that an initial rate of $1.00 per month for a nominal quantity of gas is essential. We do not pretend to pass upon any detail of the new rate schedule as to either equity or desirability; but we do believe that this is a definite step forward of mutual benefit with the utilities of New York state and to the public of that Commonwealth. The rate schedule adopted may not be ideal, but it does represent a trend that can well be imitated elsewhere. The users of insignificant amounts of gas can no longer rightly be carried with bills of a few cents per month. State officials are recognizing this fact to the advantage of the large majority of gas users. We welcome this encouragement for the trend from the commissioners of New York.

Air Conditioning

A discussion of the principles involved and an analysis and study of a typical installation in a Baltimore bank where gas is being used in conjunction with silica gel to produce the desired bodily comfort

S. PROCTER RODGERS

Industrial Fuel Department, Consolidated Gas Electric Light and Power Company of Baltimore

DURING our working hours in the hot months many of us have had until recently to depend upon cool cloth suits, fans, and cold drinks for a measure of comfort. The light, open weave suits facilitated the liberation of heat and moisture from our bodies, and the fans provided the necessary currents of air for removing the heat and evaporating the water. Certain days came though, when we had removed all the clothes that the law would allow, had speeded up the fan to the last notch, but still we were hot and sticky. Even on the exposed parts of our body the moisture stood in beads of perspiration. The breezes seemed to have no power to dry. The thermometer was high, but no more so than the day before when we had not felt half so uncomfortable. Rain had fallen during the night, too, and one had supposed that would make things less unbearable.

Humidity Effects

Someone suggested that it was the humidity, and, maybe without knowing exactly why humidity was the cause, he was right. The day before had, no doubt, had high temperatures, but the moisture content of the air had been quite low. His body, though it generated excessive amounts of heat and moisture, had felt cool because the air circulated by the fan was dry enough to cause rapid evaporation. The heat absorbed by the evaporation of this moisture helped to cool his skin and he felt comfortable even with the thermometer at 85°-90° F.

The shower that had occurred, aggravated matters, or a moisture laden breeze might have had the same effect. The evaporation of the moisture in the shower had not been sufficient to cool the hot earth and in turn the air. Instead it had been absorbed by the previously dry atmosphere with a resulting high humidity.

Thus the breeze blown by the fan had lost its power to evaporate the perspiration and though some degrees lower in temperature its cooling effect was gone. We see then that these factors join together to give the effect of what we call "comfort conditions." They are: humidity, temperature, and air movement. Purity of the air, its proper distribution, that is, without drafts, are also factors. These, however, are usually just a matter of proper filters and well designed duct systems.

Though used to advantage in the "hot" industries, appreciable air movement is not a desirable feature in offices or other public buildings. We must work then with the humidity and temperature in order to obtain the desired effect. Practice has shown that there are rather definite limits within which "comfort conditions" can be obtained. Generally speaking, the higher the temperature the lower must be the relative humidity and vice versa. The temperature of the space being conditioned is, however, closely related to outside temperatures. The reason being that when coming in from the hot street a drop in temperature of more than 15° F. causes an unhealthy shock to the human body. The reverse is also true. For example, if the dry bulb temperature outside is 100° F., then the temperature in the conditioned air space should not be less than 85° F. (D.B.). Experience tells us that for comfort the humidity should be about 40% which gives an effective temperature of 76.5° F. Knowing then what constitutes comfort conditions and a relation between the factors, temperature and humidity, our next step is a consideration of the principal systems in use for obtaining this result.

Explanation of Terms

In order to best understand the methods used, it is necessary to have a clear conception of the characteristics of air and its accompanying water vapor. Terms will be used which are sometimes confusing unless clearly defined, so these are explained first.

Absolute Humidity (H): Is the number of pounds or grains (7000 gr. equals 1 lb.) of water vapor carried by one pound of dry air.

Relative Humidity: Is the number of pounds of water vapor carried by one pound of dry air at a definite temperature, divided by the number of pounds of vapor which one pound of dry air would carry if it were completely saturated at the same temperature.

Dew Point: Is the temperature at which a given mixture of air and water is saturated with water vapor. In other words, it is the temperature at which water exerts a vapor pressure equal to the partial pressure of the water in the air.

Dry Bulb Temperature (D. B.): Is the temperature registered by an ordinary mercury thermometer.

Wet Bulb Temperature (W.B.): Is the dynamic equilibrium temperature attained by a surface wetted with water, when exposed to air under adiabatic conditions. For unsaturated air the wet bulb will always be between that of the air (the dry bulb temperature) and the temperature where condensation will begin (the dew point). For saturated air, all three temperatures become identical.

Sensible Heat: In this article, refers to the b.t.u. given up by dry air in being cooled from a higher to a

lower temperature. It is a constant quantity for each degree of change.

Latent Heat: In this article, refers to the latent heat of the water vapor contained in the air. It varies with the vapor pressure and temperature.

Air is a gas which has the power of absorbing moisture or water vapor. This capacity for absorbing moisture increases with the temperature of the air. For each temperature there is a definite maximum amount of water vapor which a pound of dry air can contain. It is then said to be saturated.

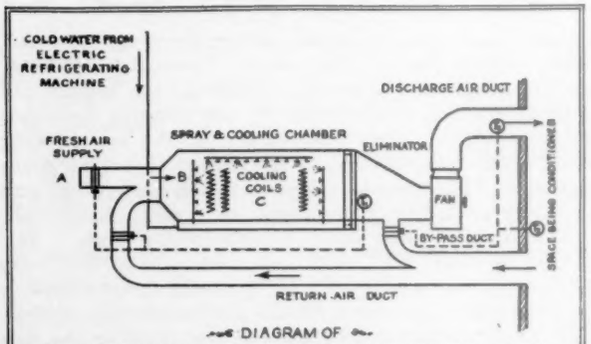


DIAGRAM OF REFRIGERATING TYPE AIR CONDITIONING SYSTEM — *FIG. 1.*

If saturated air is cooled it will give evidence of the fact by depositing moisture until that which remains is just the amount to cause saturation at the lower temperature. Fortunately, our atmosphere is seldom saturated at the higher temperatures, though countries such as England only last summer suffered from almost saturated conditions with temperatures between 80°-90° F.

This ability of air to relieve itself of moisture when its dew point is reached is an important factor in air conditioning. For instance: air at 90° F. (dry bulb) and 60% relative humidity contains 128 gr. of water vapor per lb. of dry air. If this air is cooled to 45° F., it will become saturated, but will on the way have relieved itself of 84 gr. of water vapor. If now it is heated up with steam coils to 70° F., it will have a relative humidity of only 42%. This is lower than is necessary for comfort, so instead of heating in that manner a more efficient method would be used. One cu. ft. of low humidity air would be mixed with 2.5 cu. ft. of say 80° F.-50% air recirculated from the building to give 3.5 cu. ft. of air at 70° F. and 60% relative humidity. This is roughly the method used by the electric refrigeration air conditioning systems.

Methods of Air Conditioning

Having now a clearer conception of the factors involved in comfort conditioning and the characteristics of air, we can consider the two principal methods of conditioning.

The most obvious as well as the oldest method in use is what is commonly known as the electric refrigeration system. Here the object is to so cool a portion of the air that its sensible and latent heat (moisture content) will be such that when mixed with the remaining air the temperature and humidity will be as desired. Cooling is affected in the usual manner through refrigerants such as carbon dioxide or Carrene. These, however, are not used direct, but instead cool the water for the coils and sprays placed in the air stream.

A study of Fig. 1 will give a clear conception of how a typical refrigeration air-conditioning system is arranged. The fresh air from the outside enters at A and is mixed with a portion of recirculating air at B. The mixture then passes through the cold water spray in the section C. Here the temperature would be reduced to about 45° F. All the water originally in the air above that amount which would saturate it at this lower temperature is now dropped out. This cold, saturated, but low total moisture content air, is now mixed with the recirculated air which has been by-passed around the dehumidifier. The now conditioned air of the proper temperature and humidity is drawn through the fan and distributed in ducts as desired.

Automatic or manual dampers are placed in the fresh air duct, the recirculating and the by-pass ducts as shown.

Humidity can be controlled either by varying the temperature of the cooling water or by so shifting the dampers that more or less recirculating air is passed through the cooler or dehumidifier. The latter system has the advantage of making use of the full capacity of the refrigerating machine for cooling the maximum amount of fresh air with the available refrigerating capacity.

The cost of operating such a system is not excessive. Aside from fixed charges on the investment they consist mainly of expenditures for electric power and water. Electric power, of course, is used for driving the fans, but it is principally required for the compressors of the refrigeration unit. A building requiring the delivery of 24,000 c.f.m. at 70° F. and 55% humidity will have about 25 h.p. for fans and 50 h.p. for compressors.

Silica Gel Conditioning Method

The less obvious but more recently perfected method for conditioning of air is that developed by the Silica Gel Corporation. The adsorptive power of silica gel is used for removing the latent heat (moisture content) and coils supplied with tap water control the sensible heat. But, before describing the operation of this system it would be helpful to get a clearer picture of the gel itself.

It is a hard, glassy, material with the appearance of clear quartz sand, made from sodium silicate and acid. In fact, it is a pure silicate of exceptional porosity. The pores are so small that they cannot be seen even with a microscope. It is the intense capillarity resulting from this minuteness of pore that enables the granules to adsorb so readily the moisture from the air. They will adsorb from 30 to 50% of their own weight of water without swelling or becoming moist.

When saturated with water vapor from the air, the gel is easily reactivated by heating, which drives off the adsorbed water. This process can be repeated as often as desired. The action is purely the physical result of vapor tension and intense capillarity.

In the Silica Gel units which are used for comfort air conditioning, the air to be dried is drawn by a fan through a filter and is then forced through the unit. In the unit are the beds of gel, held in multiple horizontal trays with screen bottoms. Two stage removal is used. After the first stage which adsorbs the major portion of the moisture, the now partially dry air is passed through an intercooler. The object of this is to remove the heat of adsorption generated in the first stage, as the water vapor gives up its latent heat in passing into the liquid state in the gel pores. Cooling increases the efficiency of the second stage. An after cooler is also used. Both of these are, of course, indirect and are supplied with water already once used in the coolers in the main circulating system. Thus the air can be delivered to the system at a temperature

approximately equal to that of the return of recirculated air and with a moisture content as low as desired, usually about 5 gr./lb. of dry air.

The Silica Gel dehydrator has three absorbers, so, while the foregoing process is in progress, the third absorber is being reactivated. This is accomplished by drawing through it heated air under negative pressure which drives off the moisture absorbed in the pores.

The adsorption process is continued until the gel becomes saturated to a point where its efficiency of removal is impaired. The automatic control then shifts the pneumatic dampers so that the newly activated adsorber is placed in line as the second stage adsorber. What was formerly the second stage adsorber now becomes the first and the one which had been functioning as the first stage goes on the activation phase. Usually a "comfort" installation is so designed as to shift dampers every 40 minutes, and thus complete a cycle every two hours.

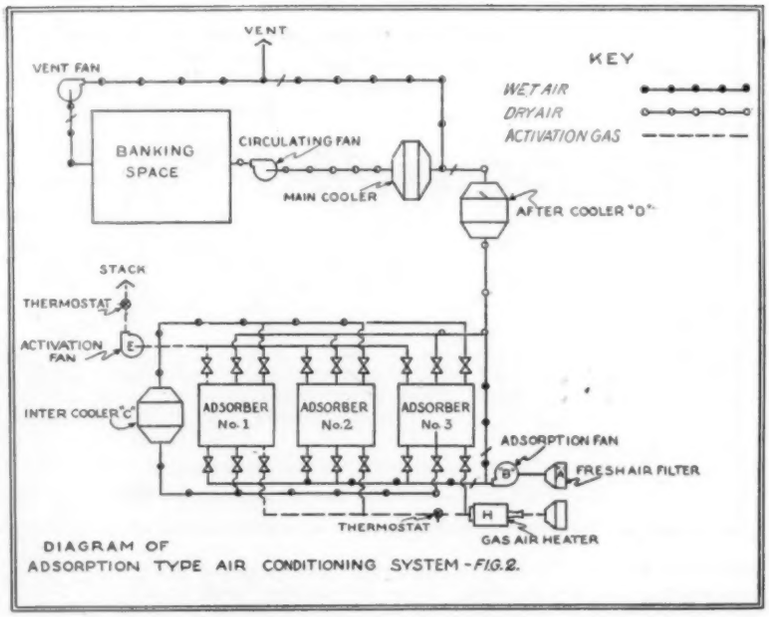


DIAGRAM OF ADSORPTION TYPE AIR CONDITIONING SYSTEM - *FIG. 2.*

If we follow the air flow through Fig. 2 which is a diagrammatic layout of a Silica Gel system, we will see how the adsorber fits into the whole system.

Fresh, moist air from the outside is drawn through the air filter A by the fan B. It is then pushed through adsorber No. 2, the intercooler C, adsorber No. 3 and after cooler D. From here the now dry air is mixed with the recirculating air, cooled, and returned to the banking space. No. 1 adsorber is being reactivated. Heated air from the air heater H is being drawn through it by the activation fan E and discharged along with the moisture to the stack. The temperature of the air leaving the Heater H is controlled by a thermostat located as shown. A thermostat is also placed in the discharge duct. This is for the purpose of cutting off the gas to the air heater when the rising discharge temperature indicates that all moisture has been removed.

Activation Phase

Having now a picture of the complete air conditioning system, we can concentrate on the particular phase of the cycle, in which we are most interested, namely, that of activation.

Physically, the problem is to raise the temperature of the beds of saturated gel to the degree at which the vapor pressure of the moisture will cause it to leave the gel and be carried away in the activating air stream. The gel beds being returned to their original state, are ready to act again as an adsorbent. This reactivation must, of course, be complete within the predetermined time, usually 40 minutes.

Thermodynamically, the work done by the gel is as follows: Adsorption occurs at about one inch of mercury, absolute, or a temperature of 80° F. The heat liberated to the air stream by this adsorption is approximately 1050 b.t.u./lb. of adsorbed water. This represents the latent heat of vaporization at 1 lb. absolute pressure. It is this heat which increases the temperature of the air stream and is removed by the intercooler after the first stage. The second stage aftercooler is used to deliver the dried air to the system at the desired temperature.

Calculations and tests indicate that 1250 b.t.u. are required at the gel bed to drive off 1 lb. of adsorbed moisture. Part is latent heat of vaporization at the activation partial pressure. The remainder is needed to bring the gel and surrounding metal up to temperature.

With an inlet temperature of 325° F. the air stream leaving the bed will follow a flat curve at approximately 125° until the moisture has been removed. Immediately this occurs the temperature rises sharply and rapidly approaches that of the inlet air. This serves as an excellent indicator. As the amount of moisture to be removed will vary, reactivation is frequently complete before the end of the cam controlled cycle. A thermostatic cutoff can thus be used to conserve fuel at this point.

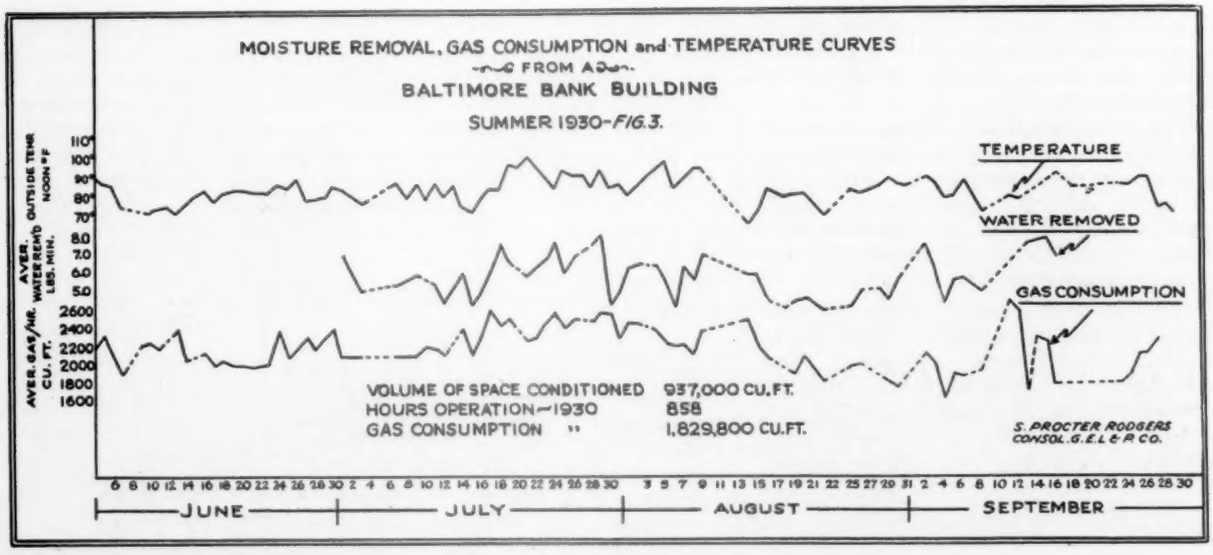
Between the limits of 325° and 125° each pound of activating air will give up about 48 b.t.u. This, together with our other figures of 1250 b.t.u. per lb of water adsorbed in the gel gives us a basis for calculating the amount of heated air required for activation.

We must next know how much water there will be to remove. This requires a knowledge of the sources of the moisture and heat load, as well as information regarding the changes of air in the space to be conditioned. This brings us to the last section of this article which will be an explanation of the effect of these factors upon the determination of a typical air conditioning system.

Factors Affecting Temperature

The sources of heat acting upon, let us say, a bank building are: conduction through walls and glass, sun effect, lights, infiltration and population. These all act to increase the temperature of any air circulated through the space. Comfort determines to what temperature we can let this air be heated. With an outside temperature of 95° F. it should be 85° F. There is also a limit on the permissible temperature differential through the area, usually 10° F. Thus the air entrance temperature must be 75° F. and the maximum in the area 85° F. These limits together with the calculated heat load fix the amount of circulating air.

The sources of moisture load are population and infiltration. With these factors known, the weight of moisture added to each pound of circulating air can be determined. Comfort also fixes the upper limit of



moisture content in connection with the upper limit temperature. For example, if in connection with the 85° F. maximum temperature a relative humidity of 40% is called for, then the upper limit of moisture content is 72 gr./lb. If we assume that the moisture loading calculations indicate 6 gr./lb. will be picked up by the circulating air as it passes through the conditioned area, then the inlet moisture content is fixed at 66 gr./lb. The work of the silica gel would then be to adsorb sufficient moisture to keep the inlet at 66 gr./lb.

Solving a Specific Problem

Let us now take a specific air conditioning problem and calculate the requirements. We will assume that our problem is to condition the air for a banking area the characteristics of which are as follows:

Characteristics of Banking Area

1—Ceiling height of area	24 ft.
2—Floor area, 150′ x 200′	30,000 sq. ft.
3—Volume of conditioned space	720,000 cu. ft.
4—Periphery of wall	700 ft.
5—Total wall surface, 700′ x 24′	16,800 sq. ft.
6—Total glass surface	3,500 sq. ft.
7—Net area of wall	13,300 sq. ft.
8—Population	400
9—Lights (continuous)	35 kw.

The calculations of heat load are just the reverse of those we would make for heating a building in winter. Now the flow of heat is *in* instead of *out*. The temperature differential is, however, less. Instead of 70° F. inside and 0° outside, we will normally have 85° F. inside if it is 95° F. outside. Generally speaking though, the factors for conductivity (K) are the same. Infiltration and sun effect are also factors. Infiltration increases both the heat and moisture load. It has been found to be equivalent in most cases to ½ change of air per hour. Sun effect varies with the degree of latitude.

The first step in the calculations is to establish the differentials which will be encountered when most severe conditions prevail. Assume that for the particular locality under consideration the outside maximum is 95° D.B., 78° W.B., 117 gr./lb. and that the inside conditions to be maintained when these prevail are 85° D.B., 40% R.H., 72 gr./lb. The temperature differential is therefore 10° F. and the moisture differential 45 gr./lb. Each person in the area will be considered as giving up 250 b.t.u./hr. and 0.15 lb. of water per hour. Electric lighting is, of course, figured at 3416 b.t.u./kw. The calculations are then:

Heat Load

	b.t.u.
1—Conduction through wall 10° × .21 (KW) × 13,300	27,900
2—Conduction through glass 10° × 1.13 (K_G) × 3,500	39,600
3—Conduction, floor and ceiling 10° × .3 (K_F) × 60,000	180,000
4—Sun effect	100,000
5—Infiltration (.241 × 10° × 720,000) ÷ (13.25 × 2)	65,000
6—Population 400 × 250	100,000
7—Lights 3416 × 35	120,000
Total Heat Load, b.t.u./hr.	632,500

If we now decide that the allowable temperature pick-up through the conditioned area is 10° F., we can readily calculate what the circulation must be. Thus:—

$$\frac{632{,}500 \times 13.35}{.241 \times 10 \times 60} = 58{,}500 \text{ cu. ft./minute}$$

This amount of air will enter the conditioned space at 75° F. It now remains to fix the moisture content required at the inlet points.

Moisture Load	**Pounds**
1—Population, 400 × .15	60
2—Infiltration $\left\{45 \text{ gr.} \times \frac{720{,}000}{2}\right\} \div 7{,}000 \times 13.35$	173
Total Moisture Load, Lb./Hr.	233

Then the moisture pick-up in the 58,500 cu. ft. per min. of circulated air will be:

$$233 \times 7{,}000 \times 13.35 \div 58{,}500 \times 60 = 6.2 \text{ gr./lb.}$$

The entrance conditions are thus fixed that.

75° D.B. 65.8 gr./lb. 62.8° W.B.

Assume that the specifications establish a minimum of 12,000 cu. ft./min. of fresh air. The same amount is, of course, exhausted through the vents and doors. Then the duty of the Silica Gel unit will be to lower a mixture of 12,000 c.f.m. of fresh air, at 95° D.B. and 117 gr./lb., and 46,500 c.f.m. of recirculated air, at 85° D.B. and 72 gr./lb., all to 75° D.B. and 65.8 gr./lb. The 58,500 c.f.m. are then supplied to the duct system under this condition of temperature and humidity. Experience shows that a Silica Gel unit of this size would require a maximum burner capacity of 1,450,000 b.t.u. It would operate from 800-1000 hours per season and the total gas used would be approximately 2,000,000 cu. ft. of 500 b.t.u. gas. This last figure, however, will vary with the season's moisture load. Fig. 3 illustrates this fact. It further shows that outside temperature variations have little effect upon the fuel consumption. This is as expected, for water cooling is used to remove the

(Continued on page 30)

Natural Gas Possibilities in Michigan

R. A. SMITH
Michigan State Geologist

UP to the last few years there was little evidence to indicate that we had as many or as strong anticlinal folds as recent drilling has definitely proved. It is practically certain that with further wildcat explorations more anticlinal folds will be discovered. It is equally certain that many of these folds will be found to have trapped oil and gas in commercial pools.

The central basin and the edges of the other basins are largely covered by sands, gravels, and clays. These form a blanket concealing most of the hard rock formations. It is almost impossible for the geologist or oil and gas operator to gain from surface observations any information about the oil and gas structures in the underlying rock formations. As a consequence information rarely can be obtained except through drilling. The costs of exploration are excessively high in many parts of the state, both from the fact that the drift is very thick and difficult to penetrate and also because of the many test wells which must be drilled in order to locate the favorable areas. The deep surface deposits are a most serious handicap to the oil and gas industry in the state.

The first noteworthy development of the oil and gas resources of the state was at Port Huron where two or three groups of wells were drilled and produced oil from the Dundee limestone at depths around 600 feet. The wells were small but the shallow depth and the presence of sufficient gas for operating purposes made it possible to produce oil for many years in a small way at Port Huron.

The next promising discovery was at Allegan, but here too the production from the Dundee limestones was small.

In 1912 and 1913 a number of small producers were drilled at Saginaw but later it proved that these wells were largely edge wells. In 1925 exploration was resumed at Saginaw, with the result that the pool was discovered. Some 325 wells were drilled but the initial and the ultimate production were relatively small. There was very little gas associated with the oil. At the present time the wells have a combined capacity of less than 200 barrels per day.

In December, 1927, the discovery well was drilled at Muskegon. This field was also within and adjacent to platted territory, with the consequent orgy of overdrilling and waste. This field, unlike any of the preceding, had a large amount of gas associated with the oil. Lot drilling quickly developed a large gas potential even before local markets could be developed. Ignorance and selfish greed led to wanton blowing of the gas into the air with consequent rapid decline in oil and gas production. It is probable that two or three times as much gas was wasted as utilized. While accurate data are not available, it would appear that the Muskegon field had a reserve of between 15 to 18 billion cubic feet, but apparently much less than half was utilized.

In 1928 the Mount Pleasant field was discovered but this field had relatively small amounts of gas associated with the oil. It is a field that has been very intelligently and conservatively drilled and operated. At the present time there are about 180 producing wells with probably more than 250 locations yet to drill. A little later oil and gas were discovered at Leaton a few miles northwest of the Mount Pleasant field, and also in Vernon township, still farther to the northwest in Isabella county.

In the meantime gas had been discovered at shallow depth northwest of Clare, Clare county, and also in Broomfield township west of Mount Pleasant in Isabella county. While these fields are only partly developed, the great depression in the oil and gas industry has restricted exploration for oil to practically offset drilling. Successive drastic price cuts for crude oil have caused operators to take a greater interest in the gas possibili-

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Portion of a paper presented before Michigan Gas Assn. Convention, Mackinac Island, June 30, 1931.

ties in the Leaton, Clare, and Broomfield districts. Gradually gas wells have been drilled until at the present time there are 17 producing wells and an estimated daily gas potential in the three districts of more than 52,000,000 cubic feet. The Broomfield territory is credited with 30 million cubic feet open flow; Vernon township 15,250,000 cubic feet; and southern Clare county about 6,000,000 cubic feet.

The rock pressure varies from about 500 pounds per square inch in Broomfield township to 570 pounds in Vernon township, and about 600 pounds in the Clare county field. The depths of the gas sand in all three fields is relatively shallow, ranging between 1300 and 1500 feet.

The proved gas area in the Broomfield district is estimated at about 3000 acres; Vernon township 1500 acres; and Clare county 500 acres, or a total of 5100 acres. The estimated potential is 43,500,000 cubic feet. Drilling to date in none of the three shallow pools has delimited the productive area. It seems very probable, if not certain, that relatively large extensions will be made to the Broomfield and Vernon gas areas, but the data available are too inconclusive to form a definite opinion as to the possible extent and reserves of the Clare county gas area. The evidence suggests the presence of an important gas producing area. Pipe lines are projected from the Broomfield and Vernon township fields and construction is reported to have already begun.

A study of the available data and information would indicate that similar shallow gas pools should be expected within an area of about 2000 square miles in the interior of the Southern Peninsula, with Mount Pleasant as a center. While it is too early to make definite assertions, it seems very probable that the gas reserves of this central district probably will prove to be of very considerable economic importance to the state. The important strikes of gas which have been struck in deeper lying formations as the Traverse and Dundee at Muskegon, and the promising showings in other formations such as the Berea sandstone, tend to support the view that with further and more systematic exploration Michigan will develop gas reserves of no inconsiderable economic importance.

Thumbs Down on Smoke and Soot

IT HAS BEEN estimated that soot and smoke cost the average city dweller at least $15 a year for needless washing, dry-cleaning, painting and damage to goods. The bill for the country as a whole reaches the appalling sum of $500,000,000. Besides this additional expense, the "smoke nuisance" detracts materially from the beauty of a city, its comfort as a place of residence, and the public health.

The Atlanta Biltmore Hotel at Atlanta, Georgia, is having its boilers over-hauled for gas equipment and will use natural gas for all purposes. In a recent radio broadcast a representative of the hotel said in part:

"The cleanliness which the installation will give us is well worth the cost, and this, translated in terms of service to guests at the Hotel is incalculable. Every Atlantan knows what a deluge of soot he encounters many mornings in the Fall and Winter; everyone of us has gone through a veritable soot shower from our homes to our offices. While the installation of gas at the Biltmore Hotel will not remedy the situation for the city as a whole, it will materially affect it so far as our guests and those living in our immediate vicinity are concerned. This is strikingly illustrated to those who can remember Atlanta's skyline a few months ago before the Atlanta Steel Company installed gas. Approaching from Marietta in those days, the sky line stood out against a smoke screen. Today, with this one plant using gas instead of coal, there is a marked difference in the view, proving that the elimination of smoke by only one huge user of fuel has a remarkable effect in greater cleanliness. We believe the time is not far distant when the majority of fuel users in Atlanta will turn to gas because of its greater cleanliness, and when that time comes, Atlanta will be an even more beautiful city than it is today."

Controlled Indoor Temperature in Treatment of Disease

AT the Cincinnati General Hospital an investigation is being made, under the direction of Dr. C. A. Mills, of the relations of atmospheric conditions to human health and comfort. A laboratory has been fitted up in the hospital where certain climatic conditions can be reproduced, and where their effects on animals can be observed. Rabbits and rats are the subjects of these experiments at present, but eventually experiments will be undertaken on human beings. The effects of high temperature and humidity are studied in a so-called "summer room," and those of a cool and fairly dry atmosphere in a "winter room." Dr. Mills looks forward to the time when controlled indoor atmospheres will be used in the treatment of disease. We shall have, he predicts, cold rooms for fever patients, and hot, moist chambers for use when blood pressure gets too high. "It seems sure," he says, "that climatic change of any type a physician may require for his patient can soon be prescribed and carried out within the hospital or in the patient's home. A climatic cure no longer needs to mean that a patient is banished from his home or sent away from the care of his own physician."—*Tycos-Rochester.*

Air Conditioning

(Continued from page 28)

sensible heat of the air.

To conclude, we must consider the fact that gas is not the only possible source of heat for activating a gel bed. Oil has been used and high pressure steam can be used for heating the activating air.

Oil is not as desirable as gas, either from an operating control, or safety point of view. The bare fuel costs are usually in favor of oil, but this will vary with local prices. An improved design of gas air heater which is now being tried out may overcome this difference in most cases.

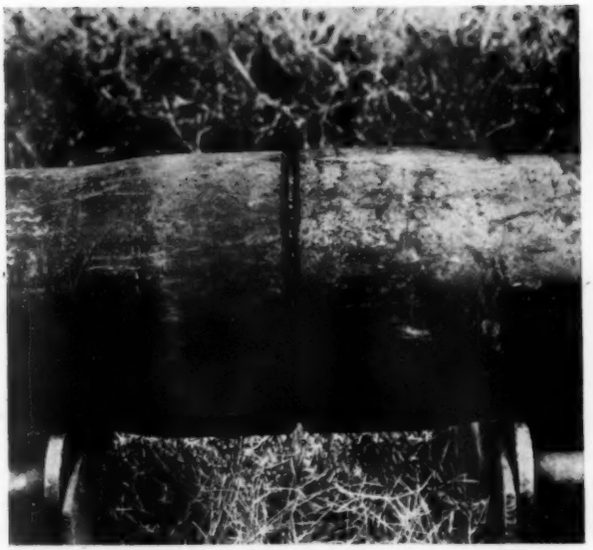
High pressure steam (150 lb. gauge) has most of the operating advantages of gas, so this competition is, in the main, a matter of b.t.u. cost at the gel bed.

To the cost of whatever fuel is used, there must be added the item of cooling water and power for circulating fans. This total cost, however, is not a high price to pay for the comfortable conditions which are thereby maintained. The owners of many public buildings are realizing this and the next few years will see an increasing number of such installations.

Physical Characteristics of Arc Welded Joints in Pipe Lines

J. F. LINCOLN

President, The Lincoln Electric Company, Cleveland, Ohio



Pipe line joints of the double bell type with chill band ready for tacking

TWO major cost items, those of construction and maintenance, can be reduced by the use of modern welding methods in the fabrication of gas pipe lines. Research and experiment in the last few years have so improved the efficiency of the electric arc process that, in one year, previous methods of arc welding have become obsolete. This is due to the development of the "shielded arc" process which produces welds of extreme ductility and a tensile strength 20,000 to 30,000 pounds greater than mild rolled steel, at welding speeds 200 to 400 percent faster than previous arc methods. The speed of construction lowers the original cost of the line and the high quality of the welds made by the process insures low maintenance costs.

The thousands of miles of gas lines welded by this method in the past year have resulted in an established procedure somewhat different from former methods. In oil lines a double bell type of joint with a backing-up ring is used in order not to increase the resistance of the line, but in gas lines the plain butt-end joint is satisfactory. A photograph shows such a joint ready for tack welding.

After the pipe is tack welded into sections the firing line gang applies two beads to the joint, a stringer bead and a finish bead. The finish bead serves to remove any chance of leakage and its application has the effect of annealing the stringer bead. Tie-in welds, made at the bell hole joints, are usually made in three to five beads. This procedure has been followed in the welding of several hundred thousand pipe-line joints.

A welded joint should have high tensile strength, freedom from porosity, ductility, and resistance to corrosion in order to withstand the various strains met by a pipe line. Laboratory experiments and tests in the field on coupons cut from the lines fabricated by this process show that, with a shielded arc, these desirable qualities are secured.

Tests made in the field included coupons from lines ranging from 4 to 26 inches in diameter and in every case the tests were conducted by the contractor or subcontractor in charge of welding. On a 24 inch line extending from the Texas Panhandle to Chicago, sections welded by the Welding Engineering Company of Bartlesville, Oklahoma, were tested; 126 coupons from one section showed an average tensile strength of 77,879 pounds per square inch. On another section, 148 coupons showed an average tensile strength of 76,580 pounds per square inch.

Three test coupons were cut from the 20 inch line fabricated by the shielded arc for Cities Service Gas Company between Dilworth, Oklahoma and Wellington, Kansas. In these samples holes 3/32 of an inch in diameter were drilled and in the first two coupons the fracture occurred in the plate. In the third sample the cross sectional area of the weld was reduced to insure breakage at the weld, which occurred in this case at 75,000 pounds per square inch.

On one section of the large line from Texas Panhandle to Chicago, the pipe line contractors changed from another method to the new process when 73 miles of their contracted 150 miles had been completed. Nineteen operators were given a day's practice with the new process and then each operator made five samples. The average tensile strength of these 95 coupons was 73,610 pounds per square inch.

Effect of Carbon

A major factor causing variations in the tensile strength of these coupons tested in the field is the carbon content of the pipe metal. Steel pipe of 0.20-0.30 percent carbon content will not give welds of as high tensile strength as will pipe of 0.25-0.35 or 0.30-0.40 percent carbon.

An example of the ductility obtained by the use of the new process is shown in one of the figures. Coupons cut from various sections on a 1000 mile line, and tested for ductility, showed an average bend in of 78 degrees and an average bend out of 96 degrees. On one section of this line the average bend out was 129 degrees, the average bend in being 97 degrees. A further proof of the ductility was illustrated in a test bar made of metal deposited in a shielded arc, which was twisted cold through 405 degrees without sign of failure.

Some of the improved qualities of welds shown by the tests is due to the use in the shielded arc process of a heavily coated extruded-type of electrode, known

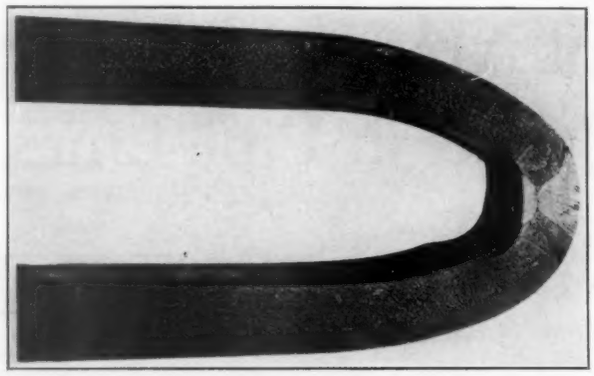
to the trade as "Fleetweld." This electrode is especially designed to prevent the formation of undesirable welds by eliminating oxides and nitrides which cause porosity, weaken and embrittle the weld.

Test bar made up of weld metal deposited by shielded arc, machined and twisted through 405 degrees without sign of failure

Welding engineers have long known that the undesirable oxides and nitrides are caused by the affinity of molten steel in the arc for oxygen and nitrogen in the surrounding atmosphere. These oxides and nitrides invite corrosion, reduce ductility and the tensile strength of the metal.

The heavy coating of special composition used on "Fleetweld" burns less rapidly than the metal core of the electrode melts in the arc, forming in effect a crucible which shields the arc, stabilizing the arc and insuring even deposition of the metal. As this coating burns, carbon monoxide and carbon dioxide are given off and form a protective envelope around the arc tending to exclude oxygen and nitrogen from the arc. A layer of easily removable slag is deposited over the weld to further protect it from the harmful effects of the air while cooling.

This heavily coated electrode is used at high welding heat and the speed of welding is increased 200 to 400 percent, thus reducing the cost of fabrication while improving the qualities of the joint so that the joint metal is comparable to the physical characteristics of the pipe metal.



Ductility of Weld Metal Deposited by Shielded Arc. Two plates shown in this coupon were butt-welded flat and then bent as shown; elongation on the outer fibres of the weld metal was 45%

Used for the first time on pipe lines in June, 1930, over 3000 miles of oil and gas lines have since been fabricated by its use. One contractor who made over 90,000 joints reports that after six months in the ground, no failures of weld or line have been reported. At present almost a quarter of a million joints have been made with the shielded arc.

Soil Corrosion Studies During 1930

DURING 1930 the bureau removed specimens representing 17 pipe materials from 70 soils. Most of the specimens are 8 years old, but 6, 4, and 2 year specimens are among those examined. The results of the examination of these specimens is published in the July number of the BUREAU OF STANDARDS JOURNAL OF RESEARCH. The data are so varied and the factors affecting them so diverse that an understanding of the details of the experiment is essential to a full appreciation of the significance of the data. There are, however, a number of conclusions which are evident from even a casual examination of the data. As in the two previous reports, it appears that soil characteristics rather than the variety of the ferrous specimens tested control the character and amount of corrosion. In some soils one material or group of materials appears superior, but in another soil the reverse may be true, and as yet no one material has been shown to be best for all soil conditions. In a large number of soils it seems probable that any well-made material will give satisfactory service. Rates of corrosion appear to vary from year to year, as do apparent relative merits of materials, and for this and other reasons it is believed that comparisons of materials should not be made until additional data have been secured.

A statistical study of the data shows that the standard error for the average performance of any one material in all soils is between 6 and 10 per cent. Considering the character of the investigation and the number of uncontrolled variables that influence the rates of corrosion, the precision of the data appears somewhat better than was expected. It should be remembered, however, that the data record only what has happened and not what will be the result at the conclusion of the work.

Rates of corrosion appear to decrease as the specimens grow older. As the rate of decrease has not been established for most of the soils under consideration, the life of the material in a given soil can not be predicted at this time. Indications are that for corrosive soils unless a satisfactory protective coating is assured it is advisable to use a pipe with a comparatively thick wall, since, whatever the material used, doubling the wall thickness will more than double the useful life of the pipe.

The data now available are helpful in the development of methods for making soil corrosion surveys. The purpose of such surveys is to predict the amount and character of coatings needed for the protection of pipe lines about to be laid or reconditioned.

Supplementary soil corrosion studies indicate that in well-defined soil series the corrosiveness is characteristic of the series, and rough estimate of the corrosion to be expected at any location within the series can be predicted upon experience elsewhere in that series. This indicates that ultimately the soil survey made by the Department of Agriculture will be helpful in determining the seriousness of soil action to be expected in many sections of the country.—*U. S. Bureau of Standards.*

A Discussion of Distribution System Pressures

H. H. GRACIE

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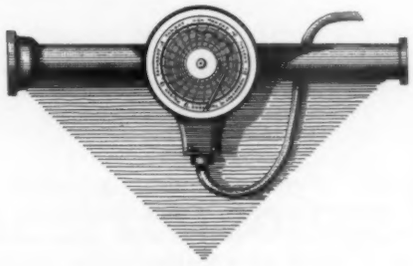


At a meeting of the Eastern District, Scottish Junior Gas Association, May 16th, the following question was propounded: ***In modern gas distribution there are found decided variations in general pressure throughout the areas. What could be considered a suitable pressure if separate consumers' governors are not widely employed, and is the installation of such governors to be recommended? If so, could not meter manufacturers embody such an instrument in their product?***

The present text, which appeared originally in the Gas Journal of London, July 1, 1931, is the reply of Mr. Gracie to this question and the same should be of some interest to gas operating men of this country.—Editor.

IN reading over this question, I felt that it was somewhat vague, and liable to misinterpretation. So, with a view to its elucidation, I asked your Secretary to give me as full particulars of the variations referred to, together with illustrations, and. if possible, the names of towns in which these variations are found; also, at the same time, to say whether these variations take place at different times of the day or night. His reply enlarging the query was as follows:

"(1) Gas supply in many areas at present is carried out by throttling down the holder pressure to (say) 4 in. or 8 in., or even more, depending on the size and character of the holder. This function is the purpose of the station governor, which usually is set to give a predetermined pressure sufficient to afford at the utmost extremity of the area controlled by it, a pressure in conformity with the requirements of the Gas Regulation Act.

"(2) These conditions imply that the pressure at appliances near the works will be much higher than at points of consumption farther away.

"(3) We find, therefore, that different undertakings will require to know the pressure drop at the extremity, and possibly at the center of gravity of the system, before deciding what figure of pressure to apply upon the outlet of the station governor.

"(4) Variations are frequently brought home to us with the publication of charts, etc., in the Technical Press.

"(5) Variations during the day or night are understood.

"(6) The question asks what is a suitable figure of pressure and implies uniformity of service to all consumers whether near to or remote from a gasworks or holder station.

"(7) The variations lie between 3 in. and 6½ in. water-column."

Varying Conditions

In reviewing these questions, it will be understood that there is considerable variation in procedure in different towns due to varying circumstances and requirements. To illustrate this point, I might remind you that many works are so situated that they have their governors located at the works sending the gas into different parts of the area. In other cases the works are some distance away, and the gas is sent from the works into district gasholders in the area. From these it is distributed through governors. In other cases governors are connected direct to the feeding mains from the works to supply the districts. Again, in other instances, high-pressure mains are introduced to boost up the low-pressure mains in the district. The initial pressure required is determined by a number of factors, such as the character of the district, the maximum quantity of gas to be delivered in a stipulated time, the size of the mains available, and the minimum pressure to be provided at any part of the town.

What Is Suitable Pressure?

The question at issue appears to be chiefly "What could be considered a suitable district pressure where separate consumers' governors are not widely employed?" In considering this query, one has to keep in view the requirements of the consumers. If these include a large percentage of consumers using gas for lighting—which is a most desirable condition, and one we should all aim at—a pressure of from 30 to 35 tenths water-gauge in the consumers' premises should be aimed at. In order to secure this and provide against small mains, service pipes, and meters, and for the loss in pressure in the meters themselves, a pressure of from 35 to 45 tenths should be kept on the outlet of the governors, and this pressure should be maintained all day—say, from 7 a. m.—and night up to between 11 and 12 p. m. Between midnight and 7 a. m. it will be found that the consumption is small, and is due principally to street lighting. The pressure can therefore be reduced over that period, as the lamps burn directly off the mains. It may be found in some areas where the pipes are old and small that a pressure in excess of even 45 tenths is necessary to maintain a proper pressure in consumers' premises; but these cases can only be discovered by inspection, and in many instances the clearing and enlarging of the pipes and meters are sufficient. In order to discover whether the various districts throughout our area of supply are adequately supplied, we have an annual inspection made of the pressures. These are carefully reviewed and any deficiencies located and attended

to. Further, we have maps prepared, and colored to show the pressure in the different districts.

Even when consumers' governors are employed, it is desirable to have a good margin of pressure in the mains, and I would not suggest, even in such circumstances, that the pressure should be less than 30 to 40 tenths. In order to overcome the difficulties forecasted —viz., the pressure at appliances near the works being much higher than at points of consumption farther away—it is desirable to avoid any dead ends on the mains, and to see that all mains are coupled up so as to provide a circuit for the gas, thereby ensuring more uniform conditions of pressure. Another method would be to boost up the low-pressure mains, wherein the pressure falls too low by means of small high-pressure mains led into the district and coupled up thereto. This boosting should only be required at peak loads, and, indeed, it can be operated automatically, the high-pressure plant starting up when the pressure falls below a predetermined level. This is in operation in quite a number of districts.

Another very effective and practical solution of the difficulty is to provide a feeding ring main round the outskirts of the districts with governors taken off at the most suitable points. These are used to send gas into the districts from the outside edge, as it were, to boost up the pressure coming from the inside or center of the district. With this scheme the different governors have to be synchronized so that a uniform pressure results. In older towns where pipes are small and the growth has been in different directions, this scheme has been very effective.

Whether consumers' governors should be recommended or not is a question which has been answered both in the affirmative and the negative; and it is not considered wise to lay down any hard and fast rule. The circumstances in each case require to be considered; but, speaking generally, these appliances, when kept in proper order and regulation, and especially when the pressure in the mains varies, give very satisfactory results. Their first cost and cost of installation have militated more than anything else against their use. On the other hand, where the margin of pressure in the mains is small, these devices may only add to the difficulty of obtaining a proper supply within the premises.

To sum up, I think the ideal system of distribution is by a ring of high-pressure mains laid around the outskirts of the district with governors feeding into the low-pressure mains, also the discriminate use of district holders and district governors. Where this is not possible, small mains should be eliminated and mains of ample capacity provided to maintain a steady and ample pressure. Where pressures vary to any large extent, service governors should be provided free of cost to the consumer, as there is no more disturbing factor in the supply of gas than a variation in the pressure at the consumers' appliances.

As regards the provision by the meter makers of governors embodied within these measuring instruments, the provision of such a device has been suggested on several occasions, and has been the subject of patents, one of which was taken out by the late Mr. Daniel Macfie in 1904. In this case a diaphragm type of governor was fitted above the valve plate, and in order to provide for varying the pressure a weight was run backwards or forwards on a screwed rod actuated by a key from the front of the meter. The arrangement looked simple, but was not taken up to any extent, probably for the following reasons:

1. The space inside the meter is limited; consequently the diameter of the diaphragm in relation to valve area is restricted. This is more apparent in small meters than in the larger ones.
2. The number of turns the gas has to make in its passage through a meter already causes a loss of pressure. To add to this loss by fixing a governor as well, especially if it is at all restricted in size, may make the loss serious, and might prevent the meter passing its correct quantity with the 5 tenths loss of pressure allowed in the Sales of Gas Acts.
3. As at present constructed, meters are fairly simple; but the addition of a governor would somewhat complicate them. The effect is also to increase cost; and this more than anything else probably operated against its use. The cost of repairs would be increased, and also the amount of attention to the meter, as well as the risk of the meter having to be taken out for a fault which might be due to the governor alone, while the meter itself was in good order.
4. While a governor of even restricted size might be embodied in the ordinary meter, there would hardly be room for one in the prepayment type, and certainly less room in the high-capacity type which is now becoming so popular. The majority of makers of the latter type of meter use the top of this meter as a passage for the gas.

A New Application of Gas

ANOTHER new and promising application of gas in which research is being undertaken is a gas-air ignition system for burning bituminous coal to accomplish increased efficiency and capacity without the production of smoke. The installation of stokers to the relatively small capacity steam boilers (less than 300 H.P.) were not generally believed practicable, until the introduction of automatic stokers for domestic heating plants using inexpensive soft coal, focussed the attention of plant owners on such equipment. Marked economies were obtained even when gross fuel savings obtained were cut to some extent by the amount of power required for forced draft. The chief obstacle, however, was that on starting and during light loads objectionable smoke was created. This latter objection will probably be overcome by the development of the gas-air jet ignition which is now under way. In its application to over-feed stokers, the fine coal can be ignited and burned in suspension in the same manner as pulverized coal, thus permitting the use of smaller sized screenings. Other economies may be expected by reducing the amount of draft required for the fire because elimination of the fine coal from the grate renders the fuel bed more porous; due to suspension burning, quicker responses to changes in load are possible and since the smoke making elements of soft coal range from 16 to 40 per cent of its total fuel value, these, if wasted, represent definite coal waste, which may be conserved by consuming these volatiles by the air-gas jets and so utilizing their heat under the boiler.

—C. E. Paige, before Society for Promotion of Engineering Education, University of Michigan.

The Cleveland Trencher Company Baby-Digger—compact-mobile-wheel-type Trencher trenching right down famous Pennsylvania Avenue in Washington, D. C. Note how its compactness and easy handling offer minimum obstruction to traffic at the same time completing the job with machine speed and economy.

The Trenching Machine—An Important Factor in Gas Distribution

A discussion of this time saving equipment from several standpoints, with some emphasis on the type of man best suited to operate it

HENRY M. RILEY

Editor, American Gas Journal

IT is safe to assume that mechanical equipment has been a real factor in making it possible for gas companies to install mains with the rapidity required to keep up with service demands. One of the time-saving devices that has played a prominent part in this gas distribution work is the trenching machine. Generally speaking, trenching machines are capable of handling any type of soil which can be dug by pick and shovel. This, of course, eliminates extremely stony soil and ledge rock. However, experience clearly shows that the savings involved from the use of a trencher as against hand digging are materially and proportionately the same regardless of the type of soil. For soils that can be dug easily by hand show corresponding increases in the speed with which they can be dug by machine and vice versa.

The scope and usability of machines for digging trench have been very greatly increased in the last ten years by the introduction of compact, comparatively light weight trenchers that can be easily and quickly transported from location to location, at truck speed, on specially built trailers and can dig efficiently in the close confined areas as well as in the clear. Several years ago, the use of trenching machines for town and suburban plant and distribution work was not feasible, for most of the machines were large and heavy, requiring considerable space in which to operate. However, at that time, there were introduced, trenchers that were so compact, and easy to handle, that they could be quickly and easily moved from job to job and were practical and economical for a large percentage of all city distribution and plant work. The introduction of this type of trencher opened up a new field for machine digging.

Because of the savings thus made possible the trencher has undoubtedly played a major role in enabling gas companies to extend their lines to serve scattered customers, whereas, because of the expense formerly involved, these extensions could not have been undertaken. Today we find mechanical trenching used in practically all of our large centers of population, for public utility officials realize that with the machine, trench is opened much quicker than with hand labor, more pipe is laid in a short period and the whole job completed in minimum time. This means less trench open over night and in many instances difficult, troublesome situations are avoided and public relations maintained at their best.

Experience, over a period of a good many years, seems to indicate that trenches can be dug mechanically with a minimum width bucket of, say, 14 to 16 inches much faster and a good deal cheaper than with a small bucket. The reasons for this are chiefly: first, a smaller bucket is incapable of handling even small stones, of which there are usually a great number in soils which might not ordinarily be classed as "stony"; second, while additional amount of dirt-handling secured with the larger bucket might be considered a disadvantage, it is a matter of no consequence in these days of the mechanical backfiller and any slight difference in cost of backfilling is more than offset by the savings in digging with the larger bucket; third, in laying gas mains, especially for city distribution, it is oftentime necessary for laborers to work in the trench (laying pipe, tunneling under driveways, and etc. and this obviously calls for a wider trench. The major problem in the efficient

operation of trenchers seems to be one of education. The first question is, how shall we control the use of the machine to get the greatest good out of it in a given period of time. In other words, how can we get the greatest amount of actual digging hours out of the trencher in the months in which weather allows excavating.

The most practical way of handling the trenchers so that they are available for maximum utility seems to be, in the experience of a number of companies, to take the operation and scheduling out of the hands of the foreman and placing it under a centralized authority, such as the executive head of the department of transportation, motor vehicles, etc. It has been found that when the trencher is put under the charge of the foreman there is a tendency on his part to try to speed up the operations too much, not allowing proper time for greasing and the ordinary care that should be given the machine while on the job. Again, when things do not go quite right, the foreman like all humans, looking for an alibi, is very liable to wrongfully blame the machine for his delays or trouble.

Advantage of Centralized Authority

By placing the machine or machines under centralized authority they can be scheduled for definite jobs several days in advance. And as trailers, which insure quick, easy transportation, are or should be provided with the trenchers, idle time is cut to a minimum. Delays on scattered jobs are materially decreased and many more of them are completed within a given period. Immediately the digging on one job is completed, the operator has his instructions and knows exactly where he is to go next. In less than five minutes he loads the trencher on the trailer and at truck speed is at the next location, with the least possible loss of productive time.

In this respect, the assistant superintendent of a prominent gas company in one of the largest cities in the country made the following statement: "A small trailer is kept with our machine and when the move is more than one mile the digger is mounted on it and towed by a truck to its new location. This type of digger (the compact, light weight type) is so easily handled that it is possible for it to keep trench ahead of four main-laying gangs fairly well scattered over a district." This is but one of many instances that have been recorded that show the value of careful scheduling of machines and the use of specially built trailers in their transportation.

Another question that should have very careful attention if we are to get the most out of our trenching machines is that of selecting the best type of operator. That is the type of operator that will be able to get the greatest footage of satisfactory trench out of the machine. If we have adopted the idea of putting the machine under the supervision of the transportation or motor vehicle or other specific department this job of picking the operator is made easier for it is the task of the department and not the individual operator or foreman, to see that the machine is thoroughly inspected and maintained and at the end of the season taken into the garage, overhauled and prepared for the next season. The operator is the key to the successful operation of a trencher. He is the man that determines whether your savings will be but 40% or as much as 80%.

The Cleveland Trencher Company Tamper-Backfiller in action. This machine will do both jobs simultaneously or one at a time

The Best Operator

Generally speaking, the best man for operator is *not* a mechanic or garage man. The most successful operators can be found laboring in the ditch. Select an industrious laborer of this type, little mechanical knowledge is required, and then such as is needed can be taught by the chief mechanic. It will be found that a laborer-operator of the type mentioned has something that it would take the average garage man or mechanic years to learn and that is a knowledge of ground conditions, location of foreign service pipes, mains, conduits, etc. The laborer-operator will also have learned how to help himself under unfavorable field conditions.

Although an old story to many in the industry the matter of cost should have careful consideration at any time when machine digging is under consideration —especially important is it at this time for wise business policy demands the greatest possible savings on all work. It is interesting to note, in this respect, that the changes in the industry have been so rapid and so vital within the years just past that the equipment manufacturers have been forced to step very fast to keep in line. They have been able however to do this and in fact keep ahead of field requirements by incorporating into their machines numerous important improvements. So far reaching have been these refinements and so much have they added to the speed and efficiency of performance and economy of operation that many progressive companies have found it good business and true economy to purchase late model machines, discarding their three or four year old trencher even though these were in good mechanical condition.

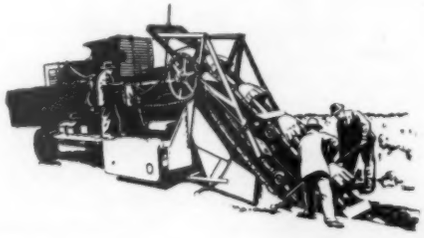
Misleading Figures

In the analysis of many cost records on a large number of jobs where conditions of soil, number of jobs to be dug, nearness of jobs to each other, general labor cost, climate, width and depth of trench required, location of trench, etc., were taken into consideration, machine trenching has proven to be the most economical way to handle the digging. To definitely state that a machine will dig a trench at 5c per foot, 12c per foot, or any definite rate is misleading and unfair unless the conditions under which it will operate are clearly known. However, carefully kept and checked records of performance over varying periods of time indicate that even in territories where labor is low the savings made by the use of machine trenching fully justify the purchase and upkeep of a trencher.

As the profitable use of a trenching machine will depend to a great extent upon the ability of the company using it, to keep it active as much of the time as possible, it is evident that, other things being equal, the mobility of the machine is of prime importance. Here the compact, comparatively light weight machine, equipped with proper trailer, has been shown to be the best all-round machine for digging gas pipe line trenches. This type of machine is well known in the industry and now in use by many gas companies in all parts of the country. To sum up, it is safe to conclude that from every angle—speed of work—efficiency of service—cost of jobs—satisfactory trench, machine trench digging is the most practical method.

Any discussion of trench digging by machine should not be logically closed without at least mention of the fact that today there is available a machine that will follow after the pipe-laying gang and backfill and tamp the excavated material quicker, tighter and more economically than was previously possible.

The mechanical tamper-backfiller should prove as efficient in the saving of time and expense as have machines in trenching. With this machine either of these two allied jobs may be done separately or, if desired, both can be carried on simultaneously. In either case, the time saved amounts to a very important item.



Metering Large Volumes of Air

A RECENT investigation of meters used for measuring large volumes of gas is to be described in the July number of the BUREAU OF STANDARDS JOURNAL OF RESEARCH. In this study a gas holder 165 feet in diameter was used as an absolute standard in testing a rotary displacement gas meter, a 24 by 12 inch Venturi meter, and 4 square-edged thin-plate orifices installed, one at a time, in a smooth 24-inch pipe. The tests were made with air.

The temperature of the air in the holder, measured by electrical thermometers, was controlled by flooding the holder with a continuous stream of water, pumped up from the tank and allowed to run down again into the tank over the crown and sides. The experiments were made at night. After the holder had been filled with air by a centrifugal booster, the connections were changed so that the booster withdrew air and forced it along the line in which the meters to be tested were installed in series. The rate of delivery was computed from the dimensions and rate of fall of the holder and observations of pressure and temperature.

The rated capacity of the rotary displacement meter was 200,000 cubic feet per hour, and the holder was undesirably large for rates lower than this, so that the precision of the measurements was less than for higher rates. Eight tests at rates between 38,000 and 173,000 cubic feet per hour gave a mean coefficient of 0.994, indicating that the meter ran 0.6 per cent fast with respect to the holder. The mean departure from the mean was ± 0.4 per cent.

Sixteen determinations of the adiabatic discharge coefficient of the Venturi, at rates between 307,000 and 612,000 cubic feet per hour, gave values from 0.986 to 0.994, with a mean of 0.990, a mean departure of ± 0.003, and no evidence of a systematic run. If two values which appeared intrinsically less reliable than the others were omitted, the mean was 0.989 and the mean departure was ± 0.002. The limiting factor in the precision was in the measurement of the fall of the holder rather than the temperature, and the four tests in which the measurements of the fall of the holder at the ends of two perpendicular diameters were most consistent gave the values $C_a = 0.988$, 0.988, 0.987, and 0.988. The values of the Reynolds number, referred to the throat, varied in the 16 experiments between 660,000 and 1,290,000, with a mean of 870,000, the values for the 24-inch pipe being about half as large.

After the Venturi had thus been standardized it was used as a meter in testing 10 additional orifices. Supplementary observations were also made on the distribution of pressure along the pipe wall near the orifices, with at least two different rates of flow for each of the 14 orifices.

The most important results of the investigation are those relating to the discharge coefficients of the orifices. When these are so reduced as to be comparable with values for water recently published by R. Witte, the agreement is very good. They may be summarized as follows:

Let C be the discharge coefficent, defined in terms of "British absolute" or cgs. units by the equation

$$M = CA\sqrt{2(p_1 - p_2)\rho_1}$$

where M = the mass flow; A = the area of the orifice; p_1 and p_2 = the upstream and downstream pressures observed at points 1 inch from the orifice plate; and ρ_1 the density of the air at p_1 and the upstream temperature.

Let β = the ratio of the diameter of the orifice to that of the pipe; $x = (p_1 - p_2)/p_1$; and $\gamma = C_p/C_v$ = the specific heat ratio of the gas. Then the results obtained may be represented within the limits $x < 0.08$ and $0.2 < \beta < 0.77$ by the equation

$$C = KY$$

in which

$$K = 0.597 + 0.41\beta^4$$

and

$$C = 1 - (0.40 + 0.46\beta^4)\frac{x}{\gamma}.$$

These relations do not hold outside the stated limits of β nor for other locations of the pressure holes, but they probably do hold for considerably higher values of the fractional differential x.— *U. S. Bureau of Standards*

Value of Indicating the Gas Compressor

RUDOLF ULRICH

Mechanical Engineer, Bacharach Industrial Instrument Co.

THE long distance natural gas line with its many booster stations makes the efficient operation of the compressors an important factor in effecting unfailing and economic transportation of the gas. The one best way of determining whether a compressor is operating properly is to apply the engine indicator.

The indicator diagram gives an accurate record of the pressure inside the cylinder while the compressor is running. It shows at a glance operating faults that cannot otherwise be discovered, such as leaking or defective valves, poor piston rings, clogged gas passages, etc., and enables to study the effect of adjustments that are considered advantageous for improving the compressor performance. The helpfulness of the indicator in maintaining a compressor in perfect adjustment is generally recognized today, and more and more compressor builders are stressing the importance of the regular use of the indicator as a means of keeping a compressor in the best condition possible.

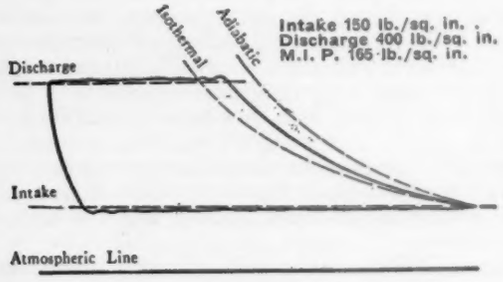


Figure 1.

Even though a compressor is apparently performing up to standard, it is well to take indicator diagrams at regular and short intervals in order to detect any troubles before they become serious. The taking of an indicator diagram is very easy, and extracting from it the information helpful for improving the performance of the compressor is just as simple, once one has become familiar with the reading of an indicator diagram.

The indicator diagrams illustrated herewith can hardly leave any question as to the value of the indicator as an aid in safeguarding the compressor.

The main use of the indicator on a compressor is to insure that the valves are in good condition. If consideration is given to the severe service under which they have to perform, it may be readily realized that the most common difficulties encountered in the operation of a compressor are valve troubles. As the valves cannot be examined while the compressor is running, their improper functioning often can be detected only by the use of the indicator.

Another application of the indicator is for keeping a close check on the tightness of the piston rings. Proper ring contact not only insures maximum output and high over-all efficiency, but reduces piston and cylinder wear to the minimum.

In addition to diagnosing compressor troubles, indicator diagrams are indispensable for determining the compressor indicated work for the purpose of checking the efficiency of the compressor and of the prime mover. In the case of a direct-connected gas engine driven compressor, a comparison of the indicated horse-power of the compressor and that of the engine as determined from the respective indicator diagrams gives the over-all efficiency of the combined unit.

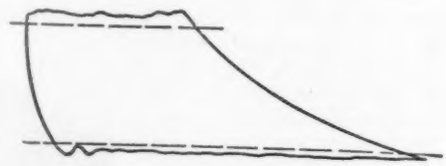


Figure 2.

As already mentioned, derangement of the valves is one of the chief troubles encountered in the operation of a compressor. Valve troubles are due to at least four principal causes, namely: valve leakage, excessive spring tension, insufficient valve area, and rupture of a moving part. All these troubles may be located easily from the indicator diagram.

Fig. 1 is an indicator diagram from a well designed and properly cared for natural gas compressor with the valves in good condition, while the diagrams Figs. 2 to 4 indicate irregularities in the operation of the valves.

Fig. 2 shows an indicator diagram when the valve springs are too strong. A stiff discharge valve spring results in the indicator recording a much higher pressure in the compressor than that in the discharge line, and similarly, a stiff intake valve spring is indicated by an abnormal drop of the pressure in the compressor below that in the intake line. The diagram areas above and below the gauge lines represent the extra work required to carry the compression and the re-expansion beyond the respective gauge pressures for the purpose of opening and keeping open the valves against the excessive spring pressure.

Fig. 3 indicates a sticking intake valve by the pronounced dip at the beginning of the intake stroke. It also will be noted that the cylinder pressure is considerably above the discharge pressure at the beginning of the discharge, but drops to nearly the pressure in the discharge line towards the end of the stroke. This

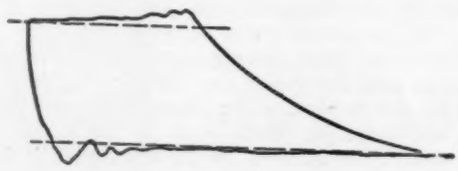


Figure 3.

sloping off of the discharge line indicates a restriction of the gas passages, such as carbon formation in the valve cages or the valve ports. Because the piston travels most rapidly at mid-stroke, just when the discharge valve opens, the pressure difference required to pass the gas through the constricted passages is greater at the beginning of the discharge, than towards the end of the stroke

when the rate of gas flow decreases due to the lessening of the piston speed. Accordingly, the discharge line approaches the actual discharge pressure towards the end of the stroke, in contrast to the indicator diagram when the valve has too strong a spring (Fig. 2). When the latter condition exists the pressure in excess of the actual discharge must be maintained constant throughout the valve opening to overcome the spring tension.

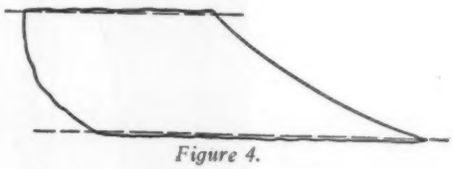


Figure 4.

Fig. 4 is from a compressor that has a leaking discharge valve. If the discharge valve leaks, some of the discharged high pressure gas will flow back into the cylinder causing a large re-expansion loss and a corresponding falling off in capacity. A leaky discharge valve may be observed on the indicator diagram by the re-expansion curve sloping off more gradually and cutting the intake pressure line later than on the indicator diagrams taken when the compressor was first installed and was meeting capacity guarantee.

Standardization and Individualism

OUR experiment in democracy was based on the theory that, under such a form of government, the individual would have the fullest means of expression, consistent with national unity. Individualism was characteristically American until we began to reach the era of standardization. Through standardization and centralized management, opportunities for self expression have been curtailed, with the result that, in our economic and social life, we have become members of groups, rather than individuals and our capacity for self expression has been weakened. Craftsmen have all but disappeared. We conform to common standards of dress and deportment, under penalty of ridicule. When required to make decisions in business, we act on advice from our superiors, sometimes because of lack of confidence in our own judgment, but more often because it is compulsory to seek such advice, or to comply with rules and regulations which cover every conceivable situation. Standardization has made mass production possible which, in turn, has led to consolidation of industries, where such consolidation is feasible. Industrial leadership has been concentrated into comparatively small groups. In the interests of efficiency and economy in management, and to oppose the influence of industrial and banking leaders, the Federal government exhibits a strong tendency to a like extension of its power, with the result that it constantly encroaches on State sovereignty. Extension of Federal power is followed by an increase of standardization, in the form of rules, regulations, decisions and orders emanating from Washington. The motives underlying such extensions are the desire of political parties to secure control of Federal offices, including Congress, through elections and, to this end, campaigns are conducted on wholly baseless assertions that banking and industrial leaders scheme to control the government. A present instance is the use of the term "Power Trust." A number of members of Congress curry favor with the elecorate by the introduction of laws authorizing the Federal government to invade fields hitherto reserved for private initiative. This tendency is in the direction of socialism. One of the planks of the Socialist party, and its ultimate goal, is government ownershp and operation of all instrumentalities of production. Some spokesmen of the two great political parties, who obtain their ideas from socialistic writers, without giving them credit, are demanding government, state and municipal ownership of public utilities. Socialism is the antithesis of individualism, which latter is the basis of our form of government. In proportion as it advances, local color disappears and life becomes a drab monotony of existence.

The solution of the problem rests with the American people, but as a preliminary to such solution they must be awakened to the facts and conditions confronting them.— *Henry M. Brundage, before New Jersey Gas Ass*

A Fine Office Building

THE new Watsonville district office building of the Coast Counties Gas and Electric Company which has just been completed at an estimated cost of $60,000, is undoubtedly one of the most beautiful buildings, from a commercial standpoint, in this section of the state.

The building, which is L shaped, is 73 feet by 100 feet, white stucco with a red tile roof, and the Spanish architecture has been carried out in every detail to resemble an old Spanish building for which California is noted.

The merchandise display room is 42 feet by 30 feet. The ceiling is rustic with concrete beams which have been cleverly stained to represent heavy timbers and the entire ceiling is beautifully painted with an old Spanish design.

Directly off the main sales floor are two model kitchens, one entirely equipped with gas appliances and the other equipped with electric appliances. The gas kitchen contains a kitchen cabinet, full automatic hot water heater, gas range, and a gas refrigerator.

The building is heated by natural gas, and water for the entire building is heated by the two hot water heaters.

Another novel feature of the new office is the employee's meeting and conference room, which may also be used for demonstrations and cooking schools as there is a kitchenette adjoining, equipped with a hot plate, sink and cupboard space.

A driveway has been erected along the side of the office with ample parking space in the rear of the building for customers.

Every Now and Again This Subject Crops Out

A short while ago we received a letter on the subject of the word "gas" and following hard in its wake came a short dissertation on the selfsame subject. We confess we are at a loss to answer the query propounded in the letter but it might be that in Mr. Kennedy's suggestion a partial solution is provided. Nevertheless there is some logic contained both in the letter and dissertation.—Editor.

Mr. Editor:

When one hears the word "Travel" his or her mind and imagination are fired with thoughts of wondrous things—the mystic Orient, the snow capped Alps, the balmy beaches of California and Florida, the haunting South Sea Islands. He or she would like to go to these places. He or she would like to travel. He or she is going to travel. He or she travels!

When one hears the word "Radio" he or she thinks of entertaining programs, beautiful music, play by play account of the big fights, hints on better housekeeping, tempting new recipes, tantalizing dance music, and many other things. He or she thinks a radio is a good thing. He or she knows a radio is a good thing. He or she must have a radio. Radio is bought!

These and other words are motivating. They invite action.

What do many individuals think when they hear the word "Gas?" It is something—the know not what—but it has a bad odor, and may be associated with gas on the stomach or some other undesirable thought. In some cases it may even suggest extreme danger, for much publicity has been given to "poison gas" as used in the World War, and "tear gas" bombs as now used by our police squads. The word is negative and non-creative.

Does the word "Gas" portray the fact that it is "Nature's Most Perfect Fuel?" If it doesn't do that very thing, then Gas should not be called Gas. It should be given another name, a magic name, a name that would do justice to the product! The name "Gas" is a white elephant to the industry. It is a brake to the progress of our business. The whole industry should drop the word "Gas" right now, and we should call our fuel—our perfect fuel—by some other name.

What say you?

(Signed) Joseph S. Willes
A "Gas" Salesman.

Editor,
American Gas Journal,
53 Park Place,
New York City, New York.

What's In A Name

JUSTIN McMURRAY KENNEDY

Special Representative, Southern Counties Gas Co.,
Santa Monica, Cal.

EXCEPT for the misadvised, prejudiced few, and those who seem to take keen delight, as well as frequent "socks on the jaw," in "kidding themselves along," gas, be it natural or manufactured, is unquestionably the superior fuel. We have made it such by rendering efficient service through the medium of properly designed equipment. Where gas is proving unsatisfactory, we alone are to blame. Gas can be made the ideal fuel in every instance, providing steps are taken to remedy conditions not conducive to effective utilization.

Holding the enviable "spot" of being the universally acknowledged preferred fuel, gas finds itself in a position of great prominence in every community. Gas has become the by-word of every household, something synonomous with industry, progress, yes, life itself.

Gas, unfortunately, has become the unfortunate victim of mistaken identity. Countless times each day, in conversations, in newspapers, advertisements, billboards, everywhere—every place, the word gas, is misused, and unjust reflections cast upon the good name of our modern fuel.

"Does 'Gas' Spoil Your Indigestion?" asks the advertisement. "Mebbe that's what's wrong," ponders the reader, and instead of cutting down on the number of slices of cherry pie consumed with each sitting of broiled halibut and butter milk, back in the cranium is built up the thought that this gas may be "not so hot" after all, 1100 B.t.u.'s notwithstanding. Of course if he had read further, he would have discovered that the advertisement referred to a very simple remedy for ridding one of intestinal stasis, or in the vernacular of

the boulevard, that rather distressing ailment—stomach "gas."

" 'Bootleg Gas' War," screeches the streamer on the sport extra as Mr. Whitecollar rushes for the "five-fifteen," and with nothing else to while the time away, he wonders about that headline—"So they're a lot of bootleggers, huh—I thought that chief clerk who explained my high bill was etc., etc." "Trying to sell us poor consumers 'punk' fuel on a par with the 'stuff' I've been getting lately." "Just another little utility war." "Anyway it's something," he concludes as he scowls at the woman loaded down with bundles who happened to be looking plaintively, yet futilely, at his seat.

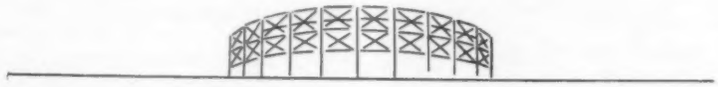
" 'Gas' Blinds Man," states another prominently displayed news item. Whether interesting to the subscribers or not, there it is in type—black and bold. Should the reader have really given a when or where, he would have learned that it was only an inconsequential incident resulting from tear gas, and that the man fully recovered his sight. But the scare-head told the whole story as far as the majority were concerned.

Through abbreviation gasoline has become popularly known as "gas," and when the automobilist drives in and orders the tank "filled up" and carelessly lights up we see in the papers that " 'Gas' Explosion Kills Two." "How sad," muse Mr. and Mrs. Public, at the same time thinking that the fuel out in their kitchen awaiting the call to serve is one and the same substance.

"Movie Star Dies From 'Gas'," which happened to come from the exhaust of his custom built motor car; "Hundreds Afflicted with 'Gas' Poisoning," which referred to those unfortunate, forgotten ones over there in Flanders; "Worker Found Dead—'Gas' Blamed," sure, but it happened to be gas from a storage battery; "Gas Creates Panic as City Rocked,"—this sewer gas will accumulate, but the dear, unsuspecting reader thought all the time it was fuel gas; " 'Gas' Explosion Kills Forty,"—they meant mine gas, but as Mister Rogers sez, "all most of us know is what we read in the papers."

The gas industry with its ever increasing complexity of problems should not be forced to suffer from gross implications.

Shakespeare or one of his contemporaries once asked, "What's In A Name?" "Considerable," quoth we, when our reputation, be it trivial or no, becomes involved. I've got it—Gaz—G-A-Z shall be our name, and henceforth our great industry shall no longer be blamed for those things for which we are in no way responsible! Similarity, ofttimes, breeds contempt, while positive distinction will prevent unjust insinuations. And anyway "our 'rose' by any other name would be just as 'sweet'," and considerably less confusing.

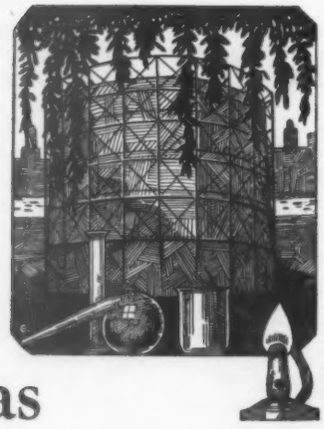


Total Supplies of Fuels Used for Domestic Purposes in the United States, 1924-1930

Department of Commerce, Bureau of Mines

Solid fuels (net tons)	1924	1925	1926	1927	1928	1929	1930
Pennsylvania anthracite production:							
Shipments of domestic sizes	56,576,296	38,305,222	54,096,437	48,999,058	46,218,403	46,141,575	42,508,088
Shipments of buckwheat No. 1 [1]	9,510,508	6,631,604	8,581,966	9,062,977	8,769,923	8,597,053	8,570,032
Shipments of smaller steam sizes	11,160,695	8,831,546	12,640,417	12,433,251	11,499,274	10,555,951	10,123,937
Local sales	3,043,939	2,884,577	2,687,411	3,046,770	3,184,825	3,233,023	3,144,434
Total commercial production	80,291,438	56,652,949	78,006,231	73,542,056	69,672,425	68,527,602	64,346,491
Anthracite exported	4,017,785	3,179,006	4,029,683	3,325,507	3,336,272	3,406,369	2,551,659
Anthracite imported, chiefly from United Kingdom	117,951	382,894	813,956	119,030	384,707	487,172	674,812
Fuel briquets produced	580,470	839,370	995,332	970,468	947,423	1,212,415	1,028,865
Fuel briquets imported	38	6,758	123,593	60,601	71,485	89,458	73,418
By-product coke sold for domestic use	2,812,771	4,085,068	5,056,568	4,702,529	6,254,382	7,376,320	7,886,432
Beehive coke sold for domestic use	139,886	392,698	386,045	111,103	78,338	134,703	141,391
Coke imported	82,833	201,579	284,548	168,859	147,701	119,724	132,674
Gas-house coke sold	[2] 1,400,000	1,368,704	[2] 1,400,000	1,484,268	[2] 1,450,000	1,400,000	[2] 1,300,000
Petroleum coke produced [3]	761,100	991,000	995,300	1,145,200	1,426,600	1,820,600	1,940,000
Anthracite and semianthracite produced outside of Pennsylvania	704,513	786,594	843,125	651,869	712,406	842,313	(4)
Bituminous coal for domestic use [5]	(4)	(4)	(4)	(4)	(4)	(4)	(4)
Oil (barrels) [7]							
Oil used for heating houses	2,800,000	5,000,000	9,080,000	11,709,000	14,271,556	17,640,556	(4)
Oil used for heating offices, hotels, apartments, schools, hospitals, and buildings other than houses	(4)	[2] 12,100,000	13,874,000	15,751,000	16,427,105	17,692,851	(4)
Gas (million cubic feet)							
Natural gas consumed for domestic use	285,152	272,146	289,175	296,036	320,877	359,853	(4)
Manufactured gas sold for domestic purposes	(4)	(4)	(4)	[6] 281,044	(4)	[6] 285,552	(4)

(1) A considerable part of the buckwheat No. 1 is used for domestic purposes. (2) Partly estimated. (3) How much petroleum coke was used for house fuel prior to 1928 is not known. For that year 235,000 tons was reported to have been consumed for domestic heating, according to E. B. Swanson in Economic Paper No. 9, Bureau of Mines. (4) Data not available. (5) During the anthracite strike of 1925-1926 about 17,000,000 tons of bituminous coal in addition to the normal consumption was used to replace anthracite. (6) Between 56,000,000 and 77,000,000 tons a year. (7) Based on surveys by E. B. Swanson, U. S. Bureau of Mines. (8) From Census of Manufactures. (The figures for 1925 and 1926 were affected by the great strike of the anthracite miners which lasted from Sept. 1, 1925, to Feb. 18, 1926.)



Calculating Gas Heating Value from Analysis

J. R. BRANHAM.
Assistant Chemist, Bureau of Standards

Publication approved by the Director of the Bureau of Standards, Department of Commerce, Washington, D. C.

RECENT analyses and heating-value determinations of the city-gas supply in Washington have afforded an opportunity to check the relationship between measured and calculated heating values. This comparison, which discloses an average difference of only 2 B.t.u. and a surprisingly close agreement on individual tests, indicates not only the reliability of calculated heating values under such circumstances, but also affords some demonstration of the adequacy of the gas-analysis procedure used.

The results summarized in the accompanying tabulation represent samples of carburetted water gas such as supplied before and after natural gas was substituted in part by the Washington Gas Light Company for the carburetting with oil. The tests reported in the table include some before the change (No. 1 and 2), some after the change (Nos. 3 to 11), and a few analyses of the city gas which was sampled and stored for several days in a gas holder over water (Nos. 12 to 16). In all cases the analyses were made with the apparatus and with the analytical procedure recommended by Martin Shepherd and recently described in the April and May, 1931, issues of *American Gas Journal*. This apparatus employs three absorption pipettes and a single combustion pipette. Carbon dioxide was removed by potassium hydroxide solution, oxygen by potassium pyrogallate, and illuminants by fuming sulphuric acid. The principal interest of these analyses to the gas chemist will be the accuracy which they indicate as obtainable when hydrogen, carbon monoxide and the saturated hydrocarbons are determined by a single combustion. This procedure avoids one of the most troublesome parts of fuel gas analysis, the separate combustion or absorption of carbon monoxide.

Sample No.	Composition of Gas							Calculated Heating Value			Observed Heating Value	Difference in Heating Value	
	CO_2	O_2	H_2	CO	CH_4	N_2	Illuminants	Total	Assuming 2008 B.t.u. for Illuminants	Assuming 2000 B.t.u. for Illuminants		B.t.u.	Percent
1	2.8%	0.6%	35.2%	29.0%	15.6%	6.3%	10.7%	100.2%	581.0	580.1	580	— 1.0	0.17
1a	2.8	0.5	35.2	28.6	15.9	6.3	10.5	99.8	578.7	577.9	580	+ 1.3	0.22
2	4.1	0.6	29.2	24.0	31.2	6.2	4.6	99.8	581.2	580.9	580	— 1.2	0.21
3	4.1	0.4	27.8	22.6	35.4	6.3	3.4	100.0	590.8	590.5	590	— 0.8	0.14
4	4.2	0.7	25.3	22.3	33.5	9.0	4.6	99.6	586.3	586.0	585	— 1.3	0.22
5	4.4	0.6	21.8	20.0	36.7	11.9	4.7	100.1	602.2	601.8	...	.....	...
6	4.7	0.6	22.5	20.5	36.8	11.0	3.8	99.9	588.9	588.6	593	+ 4.1	0.69
7	4.6	0.6	24.3	21.5	33.9	10.3	4.9	100.1	590.7	590.3	589	— 1.7	0.29
8	4.7	0.5	24.7	22.0	32.3	10.7	5.1	100.0	581.3	580.9	582	+ 0.7	0.12
9	4.9	0.4	23.9	21.6	35.2	9.6	4.3	99.9	590.0	590.6	592	+ 1.1	0.19
9a	4.8	0.4	24.2	21.4	35.2	9.6	4.4	100.0	593.2	592.9	592	— 1.2	0.20
10	1.6	0.9	18.9	15.9	8.3	48.7	5.6	99.9	309.2	308.8	309	— 0.2	0.06
10a	1.7	0.8	19.4	15.5	8.6	48.6	5.7	100.3	314.8	314.3	309	— 5.8	1.87
10b	1.6	0.6	18.8	16.2	8.2	49.1	5.5	100.0	306.9	306.5	309	+ 2.1	0.68
11	4.2	0.4	24.6	21.5	35.2	9.8	4.3	100.0	592.8	592.5	584	— 8.8	1.51
11a	4.2	0.3	24.3	21.5	35.4	9.9	4.1	99.7	589.8	589.5	584	— 5.8	0.99

All combustibles in the gas, with the exception of the illuminants, were burned with oxygen by four successive passages over a heated platinum-iridium coil in the combustion pipette. The nitrogen reported was measured directly, as the concluding step of each analysis after the absorption of excess oxygen. The percentages of H_2, CO, and CH_4 were calculated from the following equations in which

Tc = contraction resulting from combustion
O_2 = oxygen consumed during the combustion
CO_2 = carbon dioxide formed during the combustion

$$H_2 = Tc - O_2 \quad \ldots\ldots (1)$$
$$CH_4 = O_2 - 1/3\ (CO_2 + Tc) \quad \ldots\ldots (2)$$
$$CO = 1/3\ (4\ CO_2 + Tc - 3O_2) \quad \ldots\ldots (3)$$

As usual in fuel gas analysis, made without fractional distillation, saturated hydrocarbons higher than methane are reported as methane *minus* hydrogen. For example, if one per cent of ethane is present methane is reported two per cent higher and hydrogen one per cent lower than the fact. This, however, is customary and, for the usual purposes which an analysis serves, is entirely satisfactory, since heating value, specific gravity, oxygen required for combustion and the products formed by combustion of the mixture reported are practically identical with the properties of the sample actually analyzed.

The observed heating values reported were determined by a Thomas recording calorimeter checked occasionally by a Junkers calorimeter. When check heating values were determined the value reported is that given by the Junkers instrument. The agreement between the analyses and the Junkers calorimeter was, in general, as good as the agreement between the two calorimeters.

In order to calculate the heating value of the gas from the analyses, it was necessary to assign some heating value to the illuminants. This was done by assigning to the illuminants a temporary value calculated from the results of the first analysis. This meant attributing 213.9 B.t.u. to 10.7 per cent illuminants, or 1999 B.t.u. per cubic foot of illuminants. It was realized that such a value was probably in error by an unknown amount, but it was the best that could be done at the time. Therefore, the round number of 2000 B.t.u. was used as the heating value of the illuminants in computing the agreement between the calculated heating value and the value determined by the calorimeters. This value of 2000 B.t.u. per cubic foot of illuminants was in good agreement with values previously determined by analysis of Washington's carburetted water gas.

When the series of analyses was completed, the heating value of illuminants required to make the heating value of the sample (as determined by analysis) agree with the heating value given by the calorimeters was computed. The average heating value of the illuminants in the unstored samples, computed from the individual analyses and the observed heating values was 2008 B.t.u. per cubic foot.

The heating values resulting from calculation with both 2000 and 2008 as the B.t.u. per cubic foot heating value of illuminants are shown in the table. The difference between calculated and measured values is in all cases small, as shown both in B.t.u. and in percentage of heating value. In fact, the discrepancy in percentage of the heating value, except in the case of gases stored over water for some time, is so small as to indicate that the results calculated from analyses are probably as reliable as those obtained by actual calorimeter determination. This conclusion should, however, be understood to apply only to a single type of gas for which there is reliable information as to the proper heating value to be applied in calculating the contribution of the illuminants to the total.

All of the results of every analysis of city gas performed between February 11, 1931, and May 2, 1931, are included in the tables. Since no analysis was omitted the data do not represent a selected group. There were two analysts and the greater number of analyses were made by the junior member who cut his analytical teeth only six months ago. Hence the results here presented are not beyond the skill of the average gas chemist.

A Business Builder

THE local utility in the city of Corbin, Kentucky, has recently erected a Neon sign which should increasingly attract industries and thereby add to the gas output.

The fact is readily recognized that this sign is not, in reality, an advertisement for the company as it was not erected for the purpose of securing local consumers but is a very favorable medium for attracting the attention of people passing through the city as the message is broadcast on dazzling beams of light in colors of red, blue and green. The sign is 22 feet long and 10 feet high and is strategically located on a hill side in the heart of the city on the main route to Florida, so that every one who passes through, either in cars or on the train, cannot help but see and admire the sign which cost in excess of $2,000.00 plus cost of erection.

Kengreen, a subsidiary of Greenspon's of St. Louis, began serving gas in Corbin last September and at present are serving in excess of 900 consumers and have sold over $65,000.00 worth of gas appliances. Since September gas has been made available at London, Kentucky and Hazard, Kentucky.

The plants were constructed by Mr. O. Hanner, Chief Engineer, assisted by J. L. Bugg. They are now operating the plants, Mr. O. Hanner remaining as Chief Engineer and Mr. Bugg is District Manager in charge of operations as well as being Merchandise Manager.

Checker Brick in Water Gas Sets

Characteristics of hollow tiles and their action in affecting production

GEO. W. PARKER

President, Parker-Russell Mining & Manufacturing Co.

A CONSIDERATION of the matter of hollow checker tiles brings to light several interesting points in the history of the development of water gas apparatus. One patent issued as far back as 1876 relates to the *better treatment* of the oil used for enrichment, indicating that there has apparently been an ever present demand for an ideal method of cracking and fixing gas oil in water gas sets. Many patents have been taken out in the past suggesting many ingenious schemes for salvaging more B.T.U.'s from each gallon of oil.

In reviewing the art of manufacturing carburetted water gas, it did not appear up to a few years ago, that any radical change had been made in the general method of checkering carburetters and superheaters in at least thirty years. To my mind this meant that either the practice of using standard square brick was wrong in the old days when longer gas making cycles were used, or it is wrong now in our modern practice with short cycles. It seems evident that only the outside surface of the brick actually does any active work and that the volume of each individual brick needs only to be sufficient to store up during the blast whatever heat can be given off and utilized for cracking purposes during the run.

In considering the size and shape of standard checker bricks as related to their function in the set it would appear to be obvious that the center portion of a standard 2½" x 4½" x 9" checker brick performs absolutely no useful work, but merely takes up space in the shell which might otherwise be used to advantage.

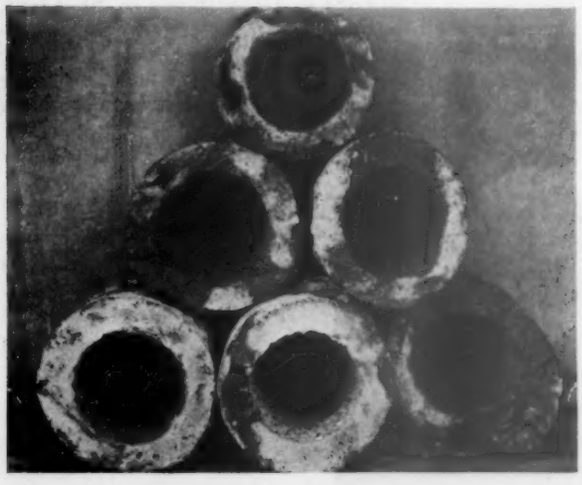


Fig. 1. Specimens from top course.

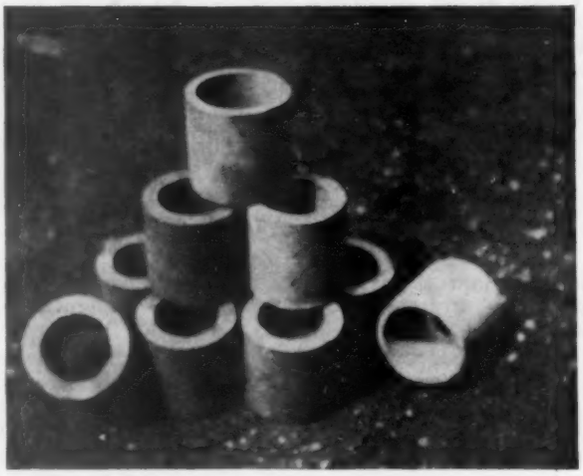


Fig. 2. Some specimens. Alloy Ring on right.

This idea of using hollow members for checker purposes was first discussed by me with several gas operators many years ago. The general idea was then thought to have some potential possibilities, but none of the men with whom I talked were particularly enthusiastic and no attempt was made at actually trying out the idea until several years later.

Not being a practical water gas operator, I had in mind at that time one principal thought; i.e., to increase the surface for cracking oil in the carburetter. Before attempting to make any actual tests quite a lot of experimental work was done in order to establish a proper mixture of fire clays to meet the severe service conditions to be encountered. This experimental work necessarily took considerable time and many months went by before any hollow checker tiles were actually sent out for test purposes.

The first few batches of tiles installed consisted of small circular sleeves with thin walls. Later on larger sleeves having thicker walls were sent out for trials, but none of these tests were entirely satisfactory due to stoppages. Figures 1 and 2 show some of these tiles which, in one test, ran approximately 2400 hours before the stoppage occurred.

Tests on Water Gas Sets with Solid and Hollow Checker Brick

	Pressures			Temperatures		Running Time	
Set No.	Air Min.	Ash Pit	Carb. Top	Carb. Base	Carb. Base	Sup. Base	Since recheckering	Since cleaning
a	7187	25.0"	11.5"	10.9"	1175	1361	2400 hrs.	8 hrs.
b	7163	24.1"	12.7"	10.2"	1280	1351	1750 hrs.	5 hrs.

Above are average readings over four blows on each set.

Range of temperature during cycle about 75 degrees on both sets at the carbureter base. Temperature shown is average over the period.

Size of sets 10'6", 8 0" carbureters and superheaters.

Set "a" carbureter checkered "flue" style with special hollow tile.

Set "b" carbureter checkered "flue" style with 2¾ x 2¾ x 9" brick.

In set "a" there were two courses of checker brick 9x4½x2½" on top of tile to hold same in position.

In set "b" the brick were spaced 3", 3½" and 4" in three equal sections, the smaller spacing being at the bottom.

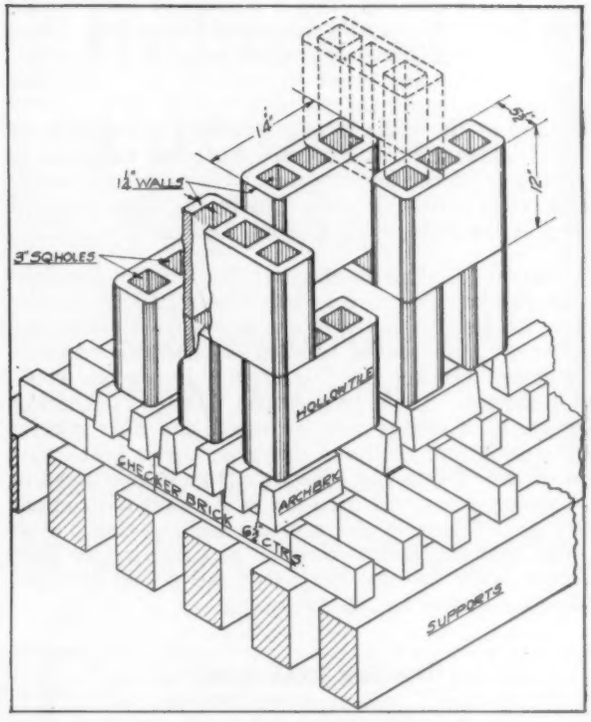


Fig. 3. Installation scheme.

Many other sample batches of hollow checker tiles were sent out to various sections of the country to secure tests under varying conditions. Included in these test samples were shapes of high temperature metal, of drawn fused Silica, moulded fuses Silica and many special fire clay mixes.

The majority of these tests showed that the tiles failed after an average of about 2000 operating hours. In some cases it was difficult to identify the different materials in the fused mass which remained where some of the test pieces had been placed.

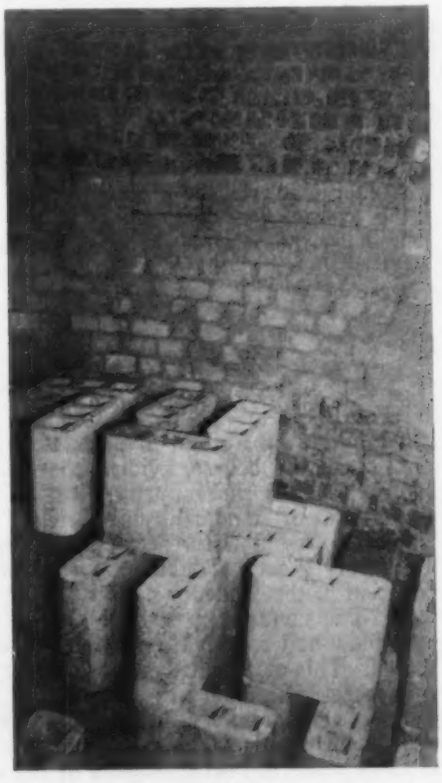
The general results from all of the above tests showed rather clearly what not to do, and indicated rather clearly what general procedure to follow in the future. With this experience the next step was to change the general dimensions of the tiles using thicker walls and to assemble the tiles so as to overcome stoppages in the structure. After quite a prolonged study two modified shapes of the tiles with thicker walls were evolved, which did not entail either manufacturing nor operating complications.

In 1929 arrangements were made for the complete checkering of two carburetters in two different plants. Of necessity these first commercial experiments were conducted in large plants so that no serious consequences would result in case of a failure. The final results of these two tests were highly satisfactory in that they showed a great improvement, but in one case there still occured some stoppage from blown-over fuel.

In later commercial tests the ratio of closed-off surface in the structure was again altered and from this point on the results have been entirely satisfactory in every respect, where regulation gas oil is used. The working out of a system that will be adaptable to the so called Heavy Oils is being investigated.

The present design of tile and method of installing is shown in Figure 3. Each individual tile measures 5½" x 14" on the base by 12" high. Each tile contains three cells, each cell being 3" x 3" with all walls 1¼" thick. This shape has the advantage of setting up so as to give a much more uniform structure than had previously been secured, as all of the individual ducts are 3" x 3" and all of the individual slots between the tiles measure 3" in width.

Figures 4 and 5 show some of these tiles in process



Figs. 4 and 5. Tiles in process of being installed in standard Water Gas set. These tiles have been in service for upwards of 50,000 hours.

of being installed in a standard set. The original tiles as shown in Figures 4 and 5 have at this writing been in service for over 4700 actual operating hours and are still in use.

It is interesting to note that while it was originally expected the greatest saving would result from a reduction in the quantity of oil required for enrichment, it has since developed that the saving in generator fuel is in most cases even greater than the saving in oil.

Operating Results on Two Sets Equipped with Hollow Checker Tiles

Make Per Run	Gals. Oil Per M.C.F.	Running Time 10 Ft. Set "A"	Running Time 11 Ft. Set "B"	Gen. Fuel Per M.C.F.	Total Gas Made 1000's
14.90	3.16	16 hrs. 41 min.	21 hrs. 24 min.	27.4 lbs.	5721
17.16	3.13	21 hrs. 44 min.	14 hrs. 38 min.	25.6 lbs.	5919
15.27	3.12	22 hrs. 6 min.	10 hrs. 26 min.	25.6 lbs.	5130
14.31	3.13	22 hrs. 13 min.	16 hrs. 38 min.	26.6 lbs.	5553
14.13	3.10	22 hrs. 5 min.	19 hrs. 31 min.	25.8 lbs.	5963
15.37	3.11	21 hrs. 59 min.	16 hrs. 30 min.	25.8 lbs.	5811
16.12	3.19	22 hrs. 31 min.	21 hrs. 9 min.	25.9 lbs.	6481
15.77	3.12	22 hrs. 8 min.	19 hrs. 8 min.	26.8 lbs.	6516
Av.	3.13	21 hrs. 26 min.	17 hrs. 26 min.	26.2 lbs.	5886M

Results based on 8 days' operations.

At the start of the test set "A" had been operating with hollow checker tiles for 1,333 hours and set "B" had been operating for 540 hours.

The generator fuel consisted of 65% bituminous coal and 35% coke. The average B.t.u. of the gas during this period was 570.

Above sets with regular brick checkering averaged 3.25 gallons of the same quality of oil and 28.5 lbs. all coke as generator fuel.

At this plant coke costs more than coal.

As generator fuel and oil account for the greater part of the cost of making carburetted water gas, it is evident that a very small percentage saved in these items will amount to a quite large saving in the course of a year's operation.

From figures obtained by a large number of gas operators, it appears that the cost of checker brick is an almost negligible item. Comparing the cost of standard checker brick in the *carburetter only*, it appears that the average gas company actually purchases for enrichment purposes somewhere in the neighborhood of $300.00 worth of oil to each $1.00 expended for *carburetter* checker brick.

Apparent Advantages

In analyzing the hollow checker tile structure as shown in Figure 3 a great many advantages seem apparent. It is, of course, evident that the hollow tile structure is *much more open* (about 100%) than a structure built of standard square brick. The horizontal surfaces presented for accumulation of blown-over fuel are very greatly reduced in area, which results in a reduction in the tendency of the structure to become choked. The surface exposed for picking up heat during the blow and for giving off heat during the run is increased. This means that the *usable* heat in the structure is increased. The pressure through the set is in every case very greatly reduced. The time contact is ncessarily increased, which can result only in a better and more uniform heat treatment of the oil vapors.

The reports received from a number of plants using hollow checker tiles verify the above advantages. These reports also emphasize such improvements as, the elimination of stoppages from blown-over fuel especially where coal is used; the possibility of using a shorter cycle and at the same time increasing the capacity of the set; increase in rate of oil input; less *variation* in temperature of checker structure; longer life of checkers; a very noticeable reduction in the absorption of carbon in the walls of the hollow checker tiles.

Attention is called to the fact that the total weight of the checker structure is less where hollow checker tile are used as compared to use of standard brick. The number of pieces to be handled is necessarily less as each hollow checker tile fills approximately one cubic foot in the set. As the gases travel through the checker structure at a slower rate of speed, the time contact is necessarily increased and this gives better heat treatment of the oil and gas. Reports from two companies have shown a material increase in the methane content of the gas. There is also a worth while saving due to the fact that the hollow checker tiles last longer than standard brick thereby increasing the period between costly shut downs for re-checkering.

Handling Peak Loads

In many plants the increase in capacity afforded through the use of hollow checker tiles means that peak loads can be taken care of without the necessity of starting up an additional set which may only be operated for a few hours each week.

It has been demonstrated that hollow checker tiles can be adapted to practically any size set now in use and our own experience includes sets ranging from as small as 3'-8" diameter inside the lining up to 9'-0" diameter inside the lining. It just happens that some of the best results reported have come from both the smallest and largest installations as yet made.

Up to the present time only one installation has been made in a straight shot oil gas set and the reports from this installation after 12½ months' operation show an increase in the B.T.U.'s in the gas for each gallon of making oil used and also an increase in the methane as compared to the gas made through standard brick checkers.

To sum up the whole matter, the use of hollow checker tiles affords a simple economical method of obtaining many advantages heretofore sought, and without making any changes of any kind whatsoever to existing carburetted water gas sets.

Considerable data in connection with the use of hollow checker tiles was assembled and presented at the Production & Chemical Conference of the American Gas Association in Philadelphia last May.

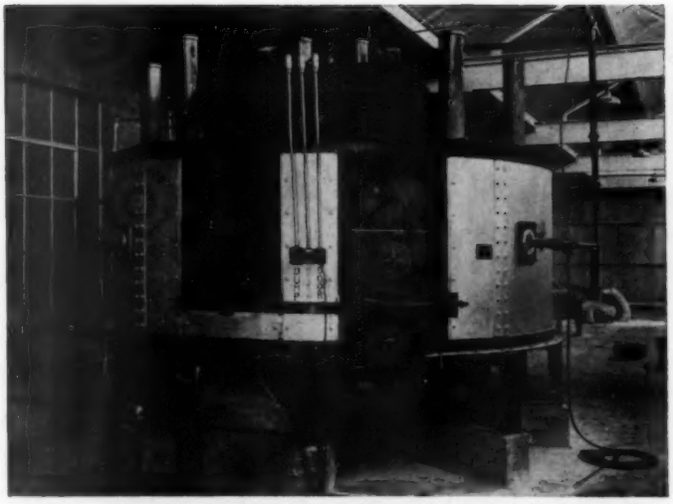
One gas company reported the taking of pressure readings under "cold" flow conditions; under "hot" flow conditions immediately after the set was started up; and again after 1500 hours of operation under "hot" conditions. Included in the report from this plant was a statement to the effect that the drop (pressure) through the standard brick originally was, and still continues to be, about four times that of the hollow checker tile.

Industrial Furnaces for Gas

VII—Special Furnaces for Heat Treating

LAWRENCE E. BIEMILLER

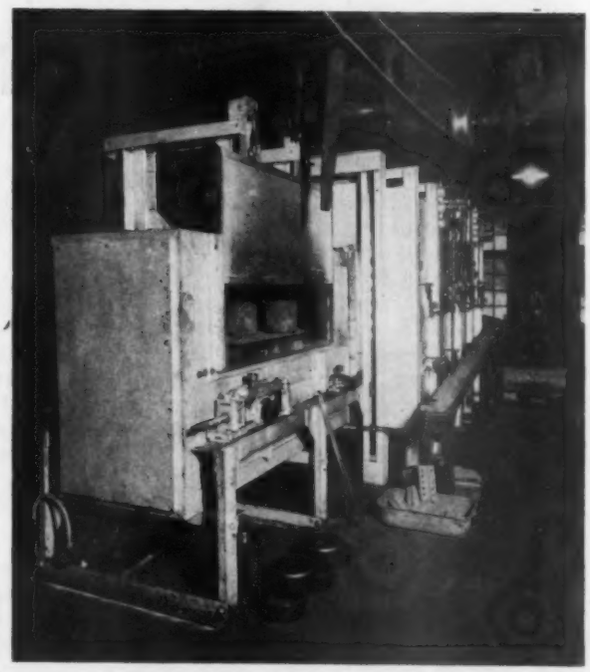
Supervisor, Fuel Sales, Consolidated Gas Electric Light & Power Company of Baltimore



Automatic Rotary Hearth Furnace of the Geo. J. Hagan Company

THE last several articles of this series have been devoted to standard furnaces for heat treating, namely pot furnaces, direct fired oven furnaces, and muffled oven furnaces. The same heat treating operations which are done on a small scale in these standard furnaces, are done on a volume production basis in many different types of special furnaces. As soon as a heating operation is performed on a volume production basis the matter of material handling becomes of very great importance. It will be noted that the material handling equipment is a very important part of the special furnaces here pictured and discussed, as typical examples of special furnaces for heat treating.

Just as some standard furnaces are full muffled to obtain a certain desired atmosphere around the material heated, some special furnaces are completely muffled. The Side Charging Furnace pictured has a charging vestibule so that the material to be treated can be placed on the conveyor in the vestibule and the charging door closed before the door separating the vestibule from the furnace proper is opened. Then the material is carried through the furnace mechanically. The use of gas on this furnace permits a compact furnace with burners firing both under and over the muffle to give maximum heat distribution. A very specialized type of muffle furnace is the Tube Hardening Furnace. In this case a number of special alloy tubes run the length of the furnace, each consisting of a muffle through which the material heated is mechanically conveyed by a pusher acting on the last material inserted. This furnace is equipped with a large number of burners supplied with low pressure gas and one pound air, proportionally mixed.



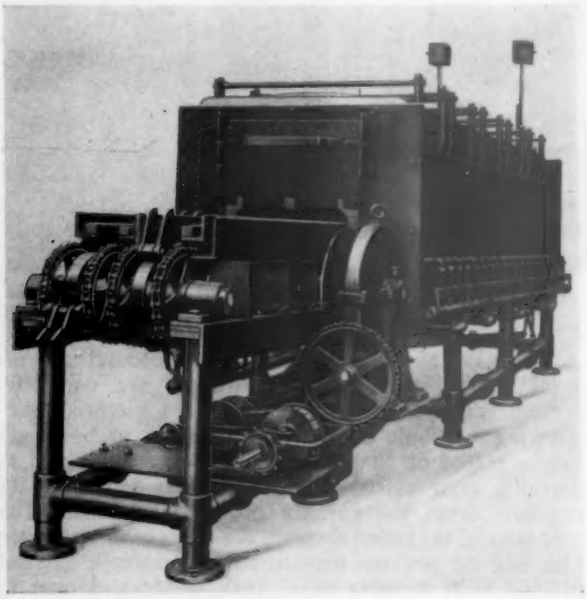
Side Charging Vestibule Furnace of Surface Combustion Co.

Hardening Furnaces

A typical furnace for hardening is the Heating Machine pictured. It is fired by twenty-one burners on each side, the burners being manifolded so as to permit control of three separate heat zones. The individual burners have a maximum capacity of 15,000 B.t.u. of gas per hour, and are supplied with low pressure gas and one pound air. The conveying mechanism is sufficiently heavily built to satisfactorily handle the tractor shoes to be hardened in this furnace. Each shoe is about 14½ inches long, and weighs about 30 pounds, and 250 such pieces can be hardened in a nine hour day.

Another furnace for hardening tractor shoes is the Pusher Type Hardening Furnace of the Electric Furnace Company. The shoes are pushed on a flat hearth by means of an electric pushing equipment having a stroke of 18 inches. To secure rapid ejection of the finished heated material, the hearth proper ends at a distance of about 20 inches from the discharge end of the furnace and at this point terminates in a chrome nickel alloy slope casting of an angle which results in rapid ejection into the conveyor type quench tank. This furnace has eight burners on one side firing between piers below the hearth, and four burners on the other side firing above the work. The burners are divided into two zones, each automatically controlled. The

heating chamber is 14 feet by 4½ feet by 22 inches. The doors are opened, and pusher actuated, automatically, at desired time intervals. A continuous conveyor type water quench tank is used. This equipment hardens and anneals in one operation, since the rail portions of the shoes are quenched, while the remainder of the shoe is slowly cooled in air while traveling above the level of the liquid in the quench tank.



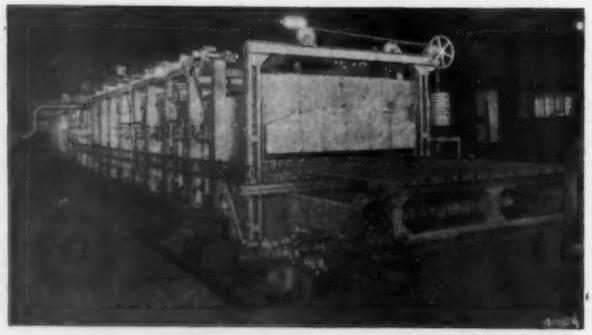
Heating Machine of the American Gas Furnace Co.

Another type of furnace used for hardening is the Automatic Discharge Rotary Hearth Furnace. The hearth consists of an annular ring, driven intermittently by means of a motor and suitable gear reducers. Mounted on the hearth are a number of alloy trays which are hinged at the outer circumference. The hearth, charging door and automatic discharge equipment are operated automatically on a time cycle. When the clock makes contact, the hearth moves forward one station, the automatic discharge mechanism lifts the tray at the discharge opening, discharging the materials down through a chute into a quench tank located below floor level. After the material is discharged the alloy tray is lowered to its original position, the charging door raises and a new charge is placed on the empty tray in front of the charging door, the charging door lowers, thus completing the cycle. The heating chamber is divided into two automatic temperature control zones, and is heated by six high pressure burners. This furnace is used for hardening bolts and nuts and has a maximum production of 1320 pounds per hour.

A furnace which has a different type of conveyor and can be used for either hardening or annealing is the Sectional Conveyor Type Furnace. The conveyor consists of a series of short alloy metal tubes or castings which are pushed one against the other through V-shaped alloy metal grooved rails, running lengthwise of the furnace, thus forming a pair of continuous moving supports carrying the stock to be heat-treated. The stock to be heat-treated may be placed directly on the tubes or on light trays carried through the chamber by the pushing movement of the tubes. This movement is provided by a motor driven mechanism acting on the last sections of tube put in the grooves. The sections of tube drop out of the grooves at the discharge end of the furnace and may be returned either manually or mechanically to the charging end for further use.

The Two Row Counterflow type of annealing furnace is one with two conveyors operating in opposite directions so that there are two rows of the material to be annealed, moving through the furnace in opposite directions. Under some conditions this results in greatly increased thermal efficiency since the material being cooled on one conveyor imparts preheat to the material on the other conveyor moving toward the high heat zone.

The Continuous Normalizing Furnace is extensively used to give a very specialized anneal to steel sheets such as are used in the automobile and metal furniture industries. These furnaces anneal sheets at the rate of 7 to 10 tons per hour. They are usually equipped with from 40 to 80 burners, and the gas consumption of a single furnace is as high as thirty million B.t.u. per hour. A popular type of conveying mechanism for this furnace is the walking beam type.



Continuous Normalizing Furnace of Surface Combustion Co.

Another type of annealing furnace very extensively used is the Car Bottom Furnace. It is particularly well adapted to the annealing of bulky castings which require an anneal taking many hours. Since the car can be withdrawn from the furnace and wheeled some distance, it is very readily loaded and unloaded by the use of cranes. The edge of the car tends to seal off the bearings and wheels from the higher temperatures of the furnace proper. A number of gas burners are applied from both sides firing well above the hearth made by the top of the car. This type of furnace should be well insulated and have the highest grade refractories.

The following question was asked by Miss Grace A. Phillips of the Public Service Company of New Hampshire in a recent bulletin on safety distributed to N. E.L.A. women sub-committee members of the New England Division: "Why should not safety in the home be taken up occasionally in the men's safety organization? Are the men making weekly surveys in their homes for hazards? Are they practicing, preaching and enforcing safety in their homes? Are they training their children to become safety minded and to have a sense of responsibility to make the homes a safe and happy place in which to live? Perhaps they are doing this but a discussion at one of their meetings would tell the story."

AMERICAN GAS MERCHANDISING ALMANACK

September

SEPTEMBER is one of the good months for the gas man who takes a pride in putting ideas into his selling plans. The month of the morning glory brings fine cool weather and finds the home manager back on the job and thinking of winter; getting the kiddies all ready to get back to school and their routine of study. September finds her thinking of purchasing a new gas range, a fire place heater and an incinerator and a clothes dryer. Homemakers Sales are in order in September.

September also brings fairs and opens up the social season, the season when folks gad about and are anxious to view and talk about "new" things that will give them added comforts during the long winter days, which they know are just ahead. Gas men should plan their window display advertisements to feature portable and fire place heaters, incinerators and dryers, tying the appliances in with seasonable colors.

As a suggestion for window display advertisements that may be used during September we offer: A display that features a new moderately priced gas range—cookies and cakes for the kiddies when they return home from school with a huge appetite; a display that ties in the use of automatic hot water service for making them fit to get to school in the morning; a display that suggests the need for a little more heat for the evening study hour. Human interest in your window displays is always good advertising—plan your windows with that thought in mind during September and watch the results.

1—Tues.	**Have your window display set up today. Cool days always produce a number of window shoppers.**
2—Wed.	Henry Hudson reached the mouth of the Hudson River, 1609.
3—Thurs.	**Make final inspection of your floor displays; see that they feature such appliances as a moderately priced gas range, a few fire-place and portable heaters and incinerator and a dryer, and that they are all properly priced.**
4—Fri.	Harold McGrath, author, born 1871.
5—Sat.	**If you have the time and material, a window display featuring Labor Day may be installed today.**
6—Sun.	President McKinley assassinated, 1901. **Run newspaper advertisement today featuring gas appliances in connection with the opening of school.** ... .
7—Mon.	Labor Day.
8—Tues.	St. Augustine, Fla., settled, 1565.
9—Wed.	**Run advertisement in newspapers featuring laundry dryer picturing the rainy days that are just ahead and the need for kiddies clothes for school.**
10—Thurs.	**Time to give some thought to change in window display which should be installed Saturday.**
11—Fri.	**Prepare newspaper advertisement to tie in with window display.**
12—Sat.	**Build a heater window; rearrange floor display; get heater advertisement to newspapers.**
13—Sun.	Gen. J. J. Pershing born, 1860. **Check over your advertisements in Sunday newspapers; study their position; check into their appeal—do they seem to register?**
14—Mon.	Star Spangled Banner written, 1814—**this fact may afford you an idea for newspaper or window display advertisement.**
15—Tues.	**If you have not already done so, rearrange your store and build new window displays.**
16—Wed.	**Run newspaper advertisement on dryers or incinerators.**
17—Thurs.	**Time to check over Sunday's newspaper advertising.**
18—Fri.	**Check-up on quota set for month and plan to put extra effort on appliances that seem to be slow movers during the next ten days.**
19—Sat.	**Be sure that copy for Sunday newspapers is o.k. and that window displays are in good condition.**
20—Sun.	**Stroll by your own store today or tonight; see what kind of an impression your window display advertisement makes on you and whether or not they are attracting attention.**
21—Mon.	First daily newspaper published in U. S., 1784.
22—Tues.	Nathan Hale, hanged as spy, 1776. **Time to go over your sales plans for next month.**
23—Wed.	Autumn begins. **Why not feature Autumn as the time to fill that empty fire place with a cheerful wood-gas fire**
24—Thurs.	Mark Hanna born, 1837.
25—Fri.	**Time to check over the advertising you expect to run next month and to see that all price tags and store and window cards are ready for use.**
26—Sat.	Balboa discovered the Pacific Ocean, 1531.
27—Sun.	British enter Philadelphia, 1777. Thomas Nast, cartoonist of Tweed Ring fame, born, 1840.
28—Mon.	Georges Clemenceau, born, 1841. **General check on all details for next month's activities should be started today. See that stocks are complete and properly priced and ready for displaying on Thursday.**
29—Tues.	Lord Nelson, of British Navy fame, born, 1758.
30—Wed.	**Get newspaper advertising to newspapers; install new window display advertisements and have the sales force and store all ready for the new activity which will start tomorrow.**

Building A Plan

DURING the past few months we have offered a number of plans for selling gas appliances. This month we offer a suggestion for building a plan. This outline shows the method employed by a man who has laid out many very effective selling plans.

This man builds his plans up into prospectus form for use by a number of operating companies. The plans as a rule are based on ten points or sections as shown in the accompanying diagram and he works out the details of each of the subject heads in sequence in the following manner:

1—Foreword: Here is set down a word about the market; the desirability of selling the appliance from the standpoint of revenue to be derived both from the merchandise and from the sale of gas.

2—Date of Activity: Here follows the date of the sale, usually one month. Where the management prefers, the activity may be conducted for a period of two weeks. (A prospectus is not built for sales of shorter duration.)

3—Merchandise: Here a brief, to the point description of the merchandise is presented, bringing out such facts as will appeal to the prospective purchaser; beauty, utility, construction, cost of operation, etc.

4—Plan of Sale: Here the details of the plan of sale are gone into. Premiums are listed and described; method of display, plan of solicitation, canvass, etc. are explained, as well as details in regard to "trade-in allowances," is trade-ins are to be offered.

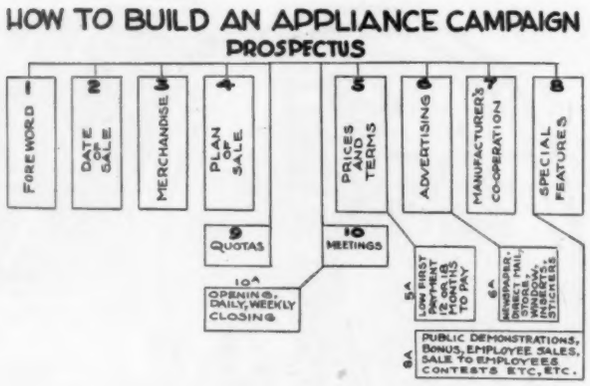
5—Price and Terms: Here the prices and terms are listed, the down payment and the monthly payment. Where payments are spread over twelve and eighteen months both plans are show in detail as well as the cash price. Salesmen are also urged, in a foot note, to sell for cash where possible and to use the eighteen months' plan only as a last resort.

6—Advertising: Under this heading descriptions of store and window displays are given, copies of newspaper advertising and mailing pieces to be used follow this page and the date and manner of release is shown below the sample or proof. Where truck banners, car cards, posters, etc. are used this fact is mentioned on this page. Accompanying the lists and samples of advertising is a message to the salesmen telling them how such promotion material will help them by way of acquainting people with the sale, and urging them to carry folder for the prospects they call upon.

7—Manufacturers' Cooperation: On this page is listed what the manufacturer is to do in the way of supplying helps, conducting meetings, awarding prizes, and personal helps for the salesmen. In event the manufacturer is to tie-in on special demonstrations, etc., the details of this plan are also given.

8—Special Features: Under this head any stunts to be employed are described in detail. By stunts are meant public demonstrations, employee sales, bonus awards for salesmen, sales to employees, contests, etc.

9—Quotas: Here salesmen's quotas, store sales quotas and employee quotas are broken down and listed. As a rule these quotas are also posted in the sales room, shop, etc., when employees are entered into the campaign, and results are tabulated daily.


HOW TO BUILD AN APPLIANCE CAMPAIGN
PROSPECTUS
1 FOREWORD
2 DATE OF SALE
3 MERCHANDISE
4 PLAN OF SALE
5 PRICES AND TERMS
6 ADVERTISING
7 MANUFACTURER'S CO-OPERATION
8 SPECIAL FEATURES
9 QUOTAS
10 MEETINGS
10A OPENING, DAILY, WEEKLY CLOSING
5A LOW FIRST PAYMENT 18 MONTHS TO PAY
6A NEWSPAPER, DIRECT MAIL, TO-A-WINDOW, INSERTS, STICKERS
8A PUBLIC DEMONSTRATIONS, BONUS, EMPLOYEE SALES, SALE TO EMPLOYEES CONTESTS ETC., ETC.

10—Meetings: Where meetings are to be held to open and close the sale and occur each morning, word to that effect is given here. It is recommended that the sale open with a morning meeting and that daily salesmen's meetings be conducted and that a big closing meeting be conducted if the sale is a success. The fact that this meeting, which is in the form of a banquet, will be held if the quota is made should be clearly stated. Awards of special prizes, etc., with not too much speech making, and a good meal with some entertainment, are recommended for this meeting.

From this outline which has been used by a group of properties, any gas man should be able to build up a prospectus or plan of sale for any kind of appliance.

The very fact that every move is clearly set down helps materially in putting a sale over. It is our experience that a written plan is worth all the time it takes to prepare, even if the selling organization consists of only four or five people including the selling salesmanager. Get the plan down in black and white and you will find that the sale will go over much better than if you simply work out the details in your own mind and then have a sale.

Modernizing the Salesroom

THAT things are happening in the properties of the Eastern States Gas Company is well shown by the accompanying photograph which shows the office and sales floor of the Anderson Gas & Utilities Company at Anderson, South Carolina which is a subsidiary company. On January 15th, this company sales room was just another store in the city of 15,000 people. Then came Mr. C. W. Shroyer, Commercial agent of the Eastern States Gas Company, in connection with sales and public relations in North and South Carolina, Georgia, Florida and Alabama. After giving much consideration to making company sales rooms over so that they would reach a maximum of attraction to the public, Mr. Shroyer and C. J. DeMers, local manager of the company, arranged to thoroughly modernize the interior, and as a result, a beautiful hardwood floor was laid, the walls were painted in two tone colors with a center rail, breaking the colors. The office space was set back, the company's safes were placed in the walls, giving more room for appliance display and the office equipment was refinished or renewed. The outside of the building was also given attention. A new awning and a new sign added greatly to the improvements going on within. The work was entirely completed within three weeks and its effect upon the company's customers and the people in

general was highly gratifying to the management. An opening and gas appliance showing was staged as a starting gun for a gas range campaign and on March 11th, when the picture shown was photographed, a large throng of people called all day and each gave expressions of wonder and astonishment at the wonderful change. In just a few weeks an ordinary store building was made over in a modern gas appliance sales floor. Much of the credit for the transformation is due Mr. J. J. McGrath, sales representative of the A-B Stove Company, who ably assisted Mr. Shroyer and the local management with suggestions and ideas. That the public was genuinely pleased with the change was well indicated by their purchases which, during the week of the opening amounted to ten (10) Gas Ranges and six (6) Automatic Storage Gas Water Heaters. Others assisting at the opening beside Mr. Shroyer and Mr. McGrath were Mr. Ed. Brewer of the Ruud Water Heater Company and Mr. Bair of the Cleveland Heater Company.

Ambitious Campaign Begins

FOLLOWING up the interest created in Brooklyn and Queens by the epochal advertising campaign inaugurated July 1st by The Brooklyn Union Gas Company for the dealers in approved gas appliances, the company has started a "Great American Servant" Refrigeration Campaign among the dealers. This campaign will run through the months of August and September.

The plan of the campaign calls for each dealer setting up a sales quota for the months of August and September. However, each dealer participating in the campaign, for which prizes are to be awarded, must agree to a quota of at least three Electrolux Refrigerators per month.

The prizes for the dealer are based on his making his quota of three refrigerators per month. Provided the dealer does this he receives as a prize $7.00 per refrigerator for the three sold as well as for each box sold over his quota. A sale consists of a delivery not later than October 15th.

Should the dealer furnish a productive lead, he receives a prize in addition to his present lead compensation. This prize consists of $3.75 and the productive lead counts one-half point toward the dealer's quota.

Dealers participating in the Great American Servant Refrigeration Campaign have been offered educational instruction for their employees on certain nights of the week.

Through this campaign, it is believed, the dealer's interest in the sale of refrigerators will be aroused. Also it is believed a permanent interest in the sale of refrigerators will be developed since the dealer will be able to realize the possibilities of selling Electrolux Refrigerators as well as the other approved gas appliances.

Announcement of the campaign has been made by Hugh H. Cuthrell, Manager of the New Business Dept. of The Brooklyn Union Gas Company, in a letter to the three master plumbers' organizations in the territory served by The Brooklyn Union Gas Company. In addition a letter has been sent to the 116 dealers displaying refrigerators which have been consigned to them by the gas company. Other dealers who are not displaying refrigerators have also been offered the opportunity of participating in the campaign.

The letter sent to the dealers follows:

"On August the 1st, the American Refrigeration Servant Campaign opens among our dealers.

"This campaign will be your chance to dominate the field in automatic refrigeration with Electrolux, the Gas Refrigerator.

"At no other time has the desire of the public been so keen as it is at present to own and use some form of automatic refrigeration. This is your opportunity to prove to yourself how completely the public desires gas refrigeration in place of any other type. Don't miss this chance to increase your earnings and decrease your overhead.

"The activity of competitors in mechanical refrigeration other than gas refrigeration can be made to accrue to your advantage. Never before have your customers had mechanical refrigeration so intensively brought to their attention. They are already "sold" on it—that is, on the automatic feature—but they have not yet decided on the type. Now is your opportunity—Go in and sell them gas refrigeration.

"The duration of this campaign is for the months of August and September. To all dealers who make their quota, there will be given a prize commensurate with the number of sales they are able to obtain in each month of the campaign. A sale to qualify for the quota must be delivered not later than the 15th of October.

"Please indicate on the attached form the number of refrigerators which you will establish as your quota during the period of the campaign. However, all dealers entering this campaign must state a quota of at least three boxes per month.

"We propose to offer you additional educational instruction for you and your men on certain nights of the week or at any other convenient time; also, such addi-

tional display and advertising material as may seem desirable.

"You will have the enthusiastic backing of our entire sales force to make your efforts a success. Here, for you, is OPPORTUNITY."

The progress of the dealer-cooperation movement in Brooklyn is realized by a study of the appliance sales record of The Brooklyn Union Gas Company. Since the inauguration of the movement two years ago last June the sales of appliances by dealers have been steadily mounting.

Dealer sales during 1930, the first complete calendar year of dealer-cooperation in Brooklyn and Queens, reached a high total. During the twelve months dealers purchased $239,596.78 worth of appliances while an additional $125,878.41 worth was sold through dealers' prospect leads.

This figure is destined to be surpassed this year on the basis of sales totals for the first six months as announced by Mr. Cuthrell. For the period ended June 30th, 1931, dealers' purchases amounted to $142,837.46 while sales through dealers' prospect leads amounted to $81,291.99.

These figures indicate an increase over last year. The dealers' purchases for the first half of this year are 60% of the total for the twelve months of 1930 while the sales through dealers' prospect leads are 65% of the total for all of last year.

Expectations of an even greater increase during the second half of this year are held because of the increased business anticipated as a result of the Great American Servant Refrigeration Contest.

Home Service Activities

A. FREEBURG

Standard Management and Operating Corporation

ONE of the most interesting features sponsored by the Home Economics Department of the Natural Gas Corporation of California, Natural Gas Corporation of Oregon and Natural Gas Corporation of Washington, is the regular weekly recipe column released to the papers in the territory where these three companies serve.

These releases are prepared by Miss Elner Martin, head of the home service department, and are made seasonal so as to lend to their attractiveness. Releases are made regularly each week to papers who are interested, and they are given the liberty of cutting them where space is limited. Where two or more papers are found in any one community, individual releases are given them for exclusive use in that area.

These columns are run under two headings, "The Kitchen Crock" and "The Cook's Corner," with mats furnished the papers as they have need of them.

The material used in these columns is primarily devoted to encouraging more and better cooking, with only incidental mention made of gas or gas service. The heading of the column carries the name of the author, together with the name of the particular company serving in that community, which serves a two fold purpose. First it continually brings the thought of gas to the minds of the readers, and at the same time they become familiar with the demonstrator so she is instantly recognized as one of authority when she arrives for personal demonstration work in the community.

Other features of the Home Service Department of these companies cover regularly monthly recipe sheets which are given to all those coming to the office to pay their bills, and by Miss Martin on her service calls.

Also, a very interesting booklet has just been put out covering the use of gas and the proper care of appliances in order to obtain maximum efficiency from their use. This booklet has some unusual recipes and one page is devoted to reasons for the variance in gas bills from month to month, which is proving a great aid in eliminating complaints from new consumers. In order to make this booklet a constant source of information complete baking guides and cooking charts were placed in the back, with several blank sheets left for the user to add her own favorite recipes.

Due to the fact that gas is almost entirely a new fuel to consumers in the territory served by Natural Gas Corporation of California, Natural Gas Corporation of Oregon and Natural Gas Corporation of Washington, a great deal of educational work has been necessary, and these releases, booklets and recipe sheets are all designed to help in this program by assisting all consumers to completely utilize the new gas service which is now available in their homes.

Effect of Changeover on Volume of Sales

IN THE changeover from manufactured to natural gas the sales are immediately cut about forty per cent due to the difference in calorific value of natural and artificial gas. The gross revenue at the same rates

will be cut by approximately the same amount, and the gross income after taxes, available for depreciation and return, is reduced by approximately sixty-seven per cent, or may entirely disappear. In Evansville the number of customers using less than one thousand cubic feet of gas per month increased from 510 with artificial gas, to 1,683 with natural gas. The number of customers using less than two thousand cubic feet of gas increased from 2,894 with artificial gas to 5,978 with natural gas. Anyone familiar with the gas industry knows what this means, and the problem is how to get the output and earnings back. The problem is how to get your sales and your earnings back. The only way to get your sales back is to sell more water heaters and such appliances to your domestic customers (and the chances are that it will be a long time before you sell enough of these to bring your domestic sales per customer back) sell more industrial gas, and more gas for house heating.

When we sell gas for these purposes it will have to be sold on a basis to compete with other fuels, and at rates that will compete.

How are you going to get your earnings back? This can be done only by the use of a proper rate schedule. Your customer is not buying cubic feet—he is buying useful heat—and a cubic foot is not a measure of heat except when a definite calorific standard is maintained per cubic foot. Therm rates, where the customer is charged for the heat which he receives, have been in use in England for some time, and have of late been put into use in Illinois. In our opinion, this is the proper standard to use for making rates to our customers. On the basis that an operating company is entitled to earn a reasonable return on the required investment to furnish the service, it is not likely that the rates will be greatly lowered from the present rates per unit of heat furnished. If the use of natural gas permits the addition of considerable business of various kinds, this additional business, when and if attached, may permit the company to lower its rates for service to the customer. Changing a town over to natural gas is a very troublesome business, not only in the mechanics of the change, but in the earnings and operating expenses of the company. As a general thing, it may well be said that a company is fortunate indeed that recovers its output in one year and its net income available for return in two years. With a proper rate schedule, based on the energy furnished to the customer, this time may be shortened. If you can induce your consumers to have some patience, good management on the part of the operating company can make it work out to their final advantage.—*James A. Brown, before Michigan Gas Assn., 1931.*

Speaking of Advertising

SEPTEMBER will bring cool days in many climes and gas men will be offering the customer quick, carefree heat for early mornings and evenings. Portable and fireplace heaters find a ready market in early fall and the gas man who is looking for ways and means to build up and steady his load will display and advertise gas heaters during the month of September. He will also keep hammering away on home heating.

PLAN NOW TO HEAT YOUR
• • • HOME WITH GAS • • •
YOU'LL wonder why you didn't think of it years ago.
Dollar for dollar, there is no expenditure you can make that will return so much to you in comfort and convenience; nothing that will give you such a sense of pleasant living, divorced from petty household cares.
Call up your Gas Company today, or mail the coupon attached to this advertisement and find out for yourself how simple it is to get rid of all your heating troubles . . . forever and forever.
CONSOLIDATED GAS COMPANY OF NEW YORK
4 Irving Place
Stuyvesant 4900
Gentlemen—Please send me information about heating my home with gas.
Name
Address
City
State

Advertising home heating and displaying home heating should be given the same careful thought and preparation as any other item that is offered to bring comfort to the home. Above is a small home heating advertisement that puts over the idea of cleanliness and comfort, while below us we show what may be done to put over the idea with a touch of humor. The latter advertisement was used as a mailing piece.

WILL YOU LIGHT THE FIREPLACE BEFORE YOU GO OUT?
TEN MINUTES LATE ALREADY!
THE MORNING AFTER THE NIGHT BEFORE
DA-DA-DEE - THIS HOMESTEAD FIRE'S A CINCH!!
THANK GOODNESS, I DON'T HAVE TO CLEAN UP THAT FIREPLACE NOW

Here's How

Sydney A. Ledbetter, Santa Monica District, Southern Counties Gas Company, tells how he averaged fifteen automatic storage water heater sales per month in 1930

IN presenting this article covering the sale of automatic storage water heaters, I will endeavor to outline the conditions as they existed in my particular territory and the results obtained during the so-called O. D. (of depression) 1930.

Conditions naturally differ considerably in almost every gas company's territory. In the Santa Monica Bay area we favor, and thus concentrate our efforts on, the sale of self-acting storage water heaters. Since it is our policy to render service on all gas burning equipment, the simplified construction of the automatic storage type heater means a minimum of servicing costs. The peak load factor is also eliminated through a widespread use of this type heater creating a steady demand in our gas send out.

Our Advertising Department plays a very important part in the success of our merchandising volume by providing a variety of sales helps. In addition to the institutional radio and bill-board advertising, the 1930 schedule included generous local newspaper copy, direct mail literature, folders announcing special water heater sales for office distribution, and attractive banners for service and appliance trucks. Our major office and the four subsidiary offices are spread out over our district, which includes some 29,870 meters, and attractive window and floor displays are maintained with framed display cards tying-in with advertising campaigns.

Every effort is made to obtain dealer cooperation by fair methods of competition, price maintenance, and strict adherence to ethical sales procedure.

Although numerous sales are the result of cold canvas or leads presented by satisfied purchasers, a considerable volume of our 1930 sales came from prospect slips submitted by the other employees of the company. As a part of the so-called "pink slip" system, each employee is supplied with booklets and as an inducement to be on the alert for prospective purchases, a five percent bonus is paid on all slips submitted resulting in sales. These five percent commissions on the net amount are accumulated and checks distributed the tenth day of each month. Amounts received by various employees are posted to stimulate greater effort among the entire personnel.

Periodically a service survey is made among domestic consumers which enables us to assemble a live prospect list. Each card is filed and tabbed listing the type and condition of the appliances in use. As intensive selling campaigns are arranged, these cards are referred to.

Many excellent prospects come from the architect-builder contact man. It is the function of this representative to call personally at every new building and interview the owner whenever possible. This contact assures complete gas service for the building and by "sales-slanting" a review of the various types of Blue Star domestic appliances paves the way for a salesman's call. A follow-up card is given the sales representative in the respective territories to complete potential sales.

As far as my own personal activities were concerned, during 1930 I averaged seven water heater calls daily, in addition to an average of ten to twenty calls pertaining to other types of domestic gas-burning equipment. The call is naturally dependent upon the particular type of appliance being stressed at a particular season. My own allotment of meters is approximately 4200 concentrated in a comparatively small area. My average monthly water heater sales were fifteen, with a total of 179 heaters for the year in sizes ranging from fifteen gallon capacity to eighty gallons. Our field is highly competitive with our smallest heater selling at $54.00, while those of our competitors retail as low as $25.00.

Since we are all victims of habit, my customary daily routine is as follows: arrive at office not later than eight a. m. and when special calls do not interfere, assemble prospect cards geographically and after completing other office routine such as report of previous day's activity, leave for the field of action not later than nine o'clock. I usually return to the office as near 12:30 noon as possible to relieve floor salesman during lunch period. Out again at 1:30 and returning at 4:45 p. m. to gather up any leads needing immediate attention or to receive information relative to evening appointments made by my co-workers. Frequent office appointments keep me in close touch with the telephone operator and floor salesman so that emergency cases are given prompt attention.

Evening calls are extremely necessary in order to close a certain percentage of sales, particularly where the "I must ask my husband" type of prospect is con-

(Continued on page 59)

Announcing the Contract for a

U. G. I.

Vertical Chamber Oven Plant

at Marquette, Michigan

for **Michigan Gas & Electric Co.**

This is the Seventh Installation of U. G. I. Chamber Ovens, as follows:

Racine, Wis.	2	Installations
Dubuque, Ia.	1	"
Clinton, Ia.	1	"
Bangor, Me.	1	"
Manchester, N. H.	1	"
Marquette, Mich.	1	"

THE U. G. I. CONTRACTING COMPANY

DIVISION OF

UNITED ENGINEERS & CONSTRUCTORS

INCORPORATED

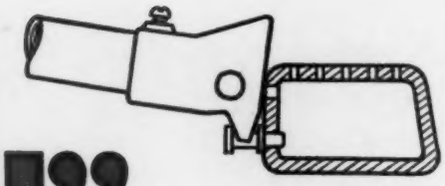
DWIGHT P. ROBINSON, PRESIDENT

Philadelphia
112 North Broad Street

Chicago
Conway Building

MAXIMUM RETURN TO CLIENTS PER DOLLAR INVESTED

"PATROL FLASH" LIGHTER

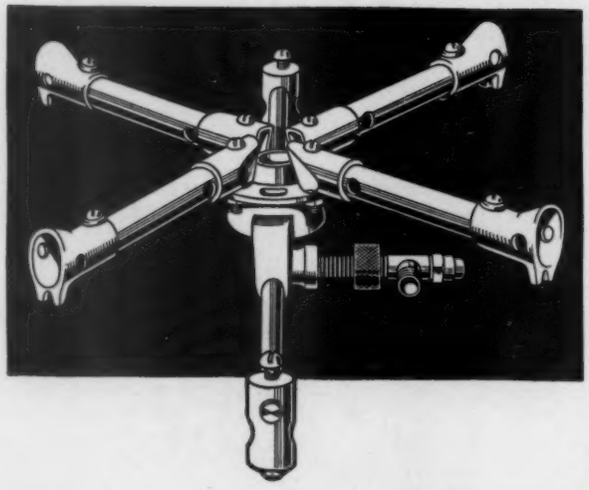


Tube-locking feature of "PATROL FLASH" is your guarantee of satisfactory service. It is exclusively a "PATROL FLASH" feature.

Without interfering with the ready removal of burners, "PATROL FLASH" lighter tubes lock firmly to the burners in the position that accurate ignition is insured.

No amount of jarring, causing shifting of burners, can reduce the efficiency of "PATROL FLASH". The tube-locking pin located directly beneath the priming port guides the tube into position and holds it fast.

At the same time, the tube on a pivot at its base (the lighter body) is easily lifted straight up off its seat on the locking-pin and swung to right or left to permit removal of the burner.



Above is a four-tube model of "PATROL FLASH" for the four top burners with tubes spread in normal operating position. Standard finish is dull nickel. Application of "PATROL FLASH" may be made to any type of gas range.

•

Write us for prices and literature.

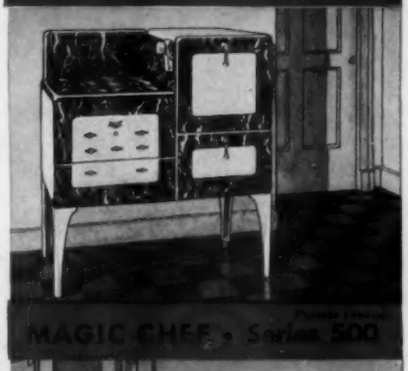
THE PATROL VALVE CO.

COR. LOCUST AVE. and W. 114th St., CLEVELAND, O.

Magic Chef
AMERICAN STOVE COMPANY

A COMPLETE LINE

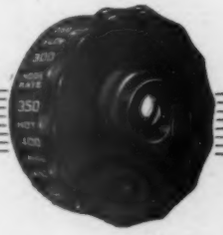
that meets every buying requirement

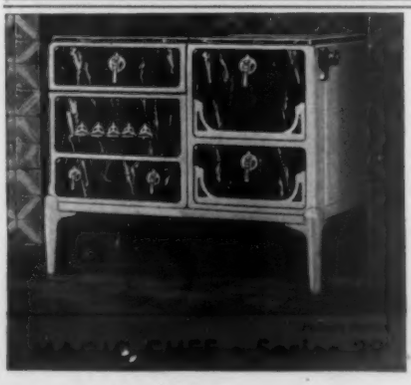


● With the Magic Chef line the dealer can blanket the gas range market in his territory. Instead of merely a single gas range of limited appeal, Magic Chef is a completely balanced line of related models that meets every buying requirement of size, design, taste and price. To further strengthen the dealer's position, the Magic Chef line has advanced features of efficiency, convenience and economy found in no other gas range.

● These features include the famous Red Wheel Oven Heat Regulator . . . safety type gas valves . . . specially designed three-in-one non-clog top burners, efficient at every point from simmering heat to hot, fast fires . . . the sanitary high burner tray which conceals pipes and valves and protects them from spattering grease . . . the distinctive cooking top covers . . . . the smooth, sanitary oven linings . . . . the rackless, reversible broiler pan which reduces chances of fats catching fire . . . the broiler extension carriage.

● Added to these advantages the Magic Chef dealer shares the benefits of extensive national advertising and the sales-winning prestige of Magic Chef leadership in the gas range field.





Unless it has a RED WHEEL
It is NOT a MAGIC CHEF

AMERICAN STOVE COMPANY

World's Largest Manufacturer of Gas Ranges

NEW YORK · PHILADELPHIA · ATLANTA · CLEVELAND
CHICAGO · ST. LOUIS · LOS ANGELES · SAN FRANCISCO

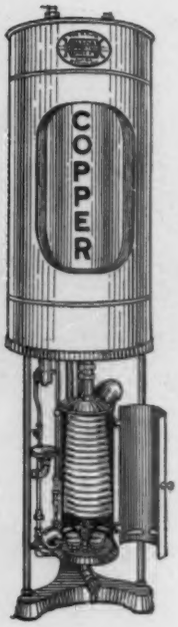
Why Kompak Heaters are made only with The 20 Year Guarantee Kompak Copper Tank

The purchaser of an automatic water heater is making an investment in home comfort. A short life, galvanized heater, is an expense, not an investment, because the tanks rusts thru in a few short years, and the gas bills start to go up within a year of use.

Thousands of low priced galvanized heaters have been sold, which are not being used automatically, and dissatisfied customers are willing prospects for electric or other competition.

The KOMPAK is the cheapest heater to operate, and it continues so. It will never wear out, and it will always give perfect service.

We believe that the American Family will gladly pay the small difference in the cost—provided they know.



THE KOMPAK CO.

Automatic Thermostatic Gas Water Heaters

NEW BRUNSWICK
NEW JERSEY

KOMPAK
TRADE MARK REG.

Here's How

(*Continued from page 54*)

cerned. Where both adults of the family work out, it is naturally impossible to accomplish any results during day-light hours. Certain evenings of every week are devoted to sales activity.

A prospect file is maintained as a part of my interior automotive equipment, and as possible sales are deferred, the cards are removed from this file to the office records from which direct mail data is obtained. In the case of change either in the design, price or terms of water heating equipment, circulars are mailed out with cards given the respective salesman for another personal contact. It has been our experience that direct mail with prepaid return post cards are only partially successful.

It has always been my endeavor to contact "key members" of civic clubs and women's organizations. Since the word-to-mouth variety of advertising is an unbeatable medium sales to influential persons of local prominence are real assets toward acquiring live leads and worthwhile testimonials. The woman's page of our daily paper is searched carefully for the purpose of obtaining information regarding marriages, moving of consumers to new homes, alterations et cetera.

Strange as it may seem, except of course to the native sunny Californian, our peak water heater sales in this region occur during warm weather due to sea bathing requiring greater quantities of hot water for showers and the wearing of washable garments.

Personal calls are preferred, rather than telephone conversations, and since my territory is fairly congested little time or effort is wasted by this method. With the California bungalow kitchens and porches in many instances compact to the extreme, a personal visit is usually necessary to measure space and ascertain size of heater essential to take care of the purchaser's requirements. As a result of amendments made in the building codes, in many installations the venting conditions must be changed to conform to present ordinances; another reason why a personal survey is essential before a sales contract can be closed satisfactorily.

As a part of my sales portfolio I keep an up-to-date list of names, addresses, and sizes of all water heaters sold as well as photostatic copies of testimonial letters received from satisfied customers regarding low operating cost, abundance of hot water for sundry needs, and neatness of workmanship at time of installation. It may also be of interest to learn that the policy of the Southern Counties Gas Company relative to members of installation crews being arrayed in well kept uniforms has created a very favorable impression among our consumers.

Within ten days after installation I personally call at the purchaser's premises to inquire regarding heater's performance and if possible obtain an expression of satisfaction. A second call back is made within thirty days while consumer's enthusiasm is at its highest level in order to obtain other names of friends or acquaintances who may have expressed a desire for similar continuous hot water service.

Contest Paves Way to Neater Display Rooms

RODGER K. TENNEY

North Shore Gas Company

NEATNESS is of great importance in a gas company office if prospects for appliances are to be attracted and not repelled. While, perhaps, most gas companies take precautions to maintain all of their premises in an orderly, presentable condition, many times there may be smaller things which escape notice of employees but which create an unfavorable impression on customers. What may be an insignificant matter in itself may affect the attitude of an appliance prospect to such an extent that his attention is taken away from the business at hand, distracted to a point where a salesman has much greater difficulty in interesting and selling him. Tidiness also is an important factor in bringing persons into the display room, for it is only natural that prospects enjoy a visit in a display room that is clean and orderly more than they do in one which offends their sense of orderliness.

Realizing the facts just mentioned and wishing to make their display rooms so attractive that no fault whatever could be found with them, the North Shore Gas Company held a contest with all of its five offices participating. The original contest was staged the latter part of last year with a real silver trophy cup as the prize. While the first event was a success it did not arouse the keen interest which a subsequent contest created among the employees in the various districts. With the silver cup in circulation, enthusiasm was at a higher pitch and every district set out to win with a determination much more intense than was expressed in the previous contest.

No doubt the desire to wrest the cup away from the district then holding it helped promote increased interest. It was this greater interest the North Shore Gas Company hoped to inspire, and did inspire as the contest developed. Every district manager instructed employees under him to maintain special watch and care over the appearance of the office and display room, as well as other parts of the premises, so that when the judges made the rounds no detail that might draw a demerit, would have been overlooked.

One district manager urged his subordinates to great-

er care with the following letter. This letter was handed to each employee in the district office and then fastened to the bulletin board where all announcements are posted.

"A few months ago the company inaugurated a contest in which a silver cup was awarded the office which had the neatest appearing office and shop. This cup was awarded the Winnetka district and our district, Highland Park, was in third place.

"During October the cup again is being offered to the office with the neatest sales floor, office and shop. We would like each and every employee to help bring this cup to Highland Park. In order to do so, it will be necessary to carry out the following suggestions:

"Do not throw cigarettes or any scraps of paper on the floor; do not leave any unnecessary books or papers on desks, unless these are being worked on; when an appliance is delivered and it is necessary to remove this appliance from the sales floor, either replace it with another appliance or distribute the appliances remaining in a suitable arrangement; if the occasion arises to put a new appliance on the sales floor, be sure that this is cleaned and assembled properly; do not bring any extra material from a job and lay it around the shop, but put it back in its place; keep all parts of the premises in an orderly condition.

"If the above suggestions are kept in mind, no doubt we will be awarded this cup.

"We will appreciate every employee reading this bulletin carefully and making every effort to co-operate to the fullest extent."

The letter was signed by the district manager and as it developed, it produced what was intended. The Highland Park district won the trophy cup, but by a small margin. The letter warning every employee to use exceptional care in maintaining the various parts of the office in a tidy condition undoubtedly was the cause of this office coming out ahead. The smaller things, which probably would not have been attended to with such care had it not been for the letter, were given more than usual consideration, and because of this, other things being equal, this office won. Glaring defects or disorder are quickly noted and remedied, but it is things which may be thought of as trivial that in many cases mark the difference between a perfectly groomed display room and one which lacks the full attractiveness it could attain.

The Legal Side of Our Industry

Leo T. Parker discusses

When Commission May Increase Rates
Discontinuance of Service
Ordinance Restricting Rates
Validity of Franchise
Interpretation of State Law
What Is Franchise?
Monopolistic Franchise
Liability of City for Injuries

When Utility Commission May Increase Gas Rates

GENERALLY speaking, in a litigation involving the right of a Public Utility Commission to compel a gas company to *lower* its rates, the validity or constitutionality of the state laws which relate to the authority of the commission, is an important consideration. However, the situation is different if the commission is endeavoring to compel the gas company to increase its rates.

For instance, in Public Service Commission *v.* Great Northern Utilities Co., 284 Pac. 772, it was disclosed that an established gas company adopted rates from 50 cents per 1,000 cubic feet down to 30 cents per 1,000 cubic feet. Later a rival concern commenced serving a part of the city at rates of from 35 cents to 22½ cents, and thereupon the older company reduced its rates to from 20 cents down to 15 cents per M. The rival company complained to the Commission and after a hearing the Commission ordered the older company to file its schedule fixing its rates the same as those of its rival.

Litigation developed over the right of the Commission to compel the gas company to increase its rates. It was contended that the constitutionality of the state laws regarding enforcement of an order by the Commission was an important consideration. However, the Court refused to consider this argument, and said:

"In the ordinary action challenging an order requiring a utility to lower its rates on the ground that the order is unjust and unreasonable, the only question presented would be as to the constitutionality of the statutes authorizing such enforcement. Here the order is not that the utility should lower, but that it should raise its rates, and the constitutionality of the statutes could only be raised on a showing of injury or prejudice."

Gas Company Held Required to Obtain Consent from Utility Commission to Discontinue Its Service

The primary duty of a public utility is to serve on reasonable terms all those who desire the service it renders. This duty does not permit it to pick and choose and to serve only those portions of the territory which it finds most profitable, leaving the remainder to get along without the service which it alone is in a position to give.

For this reason it is generally held that a public utility company cannot discontinue its service without obtaining permission of the Public Utility Commission.

For example, in City of Cleveland *v.* East Ohio Gas Co., 170 N. E. 586, a contract was entered into between the City of Cleveland, Ohio, and the East Ohio Gas Company, by the terms of which the gas company agreed at a specified rate to supply gas to the inhabitants.

The East Ohio Gas Company had invested in the city of Cleveland somewhere between thirty-five and forty millions of dollars, and the city of Cleveland in laying pipes into their homes and supplying the apparatus and fixtures necessary for the use of gas have expended probably a sum equal to that expended by the gas company. At the expiration of the contract a disagreement arose between the city and the gas company, and the latter decided to discontinue its service.

Therefore, the question presented the Court was whether the East Ohio Gas Company can withdraw its service without first making an application to the Public Utilities Commission of Ohio for permission to discontinue such service, and whether, if the commission thought it expedient or to the best interests of all concerned to permit such discontinuation of service it might authorize it.

In holding that the gas company must obtain permission from the commission, the Court said:

"It must be remembered and always kept in mind that the real parties in interest in this lawsuit are the 200,000 users

of the gas. The city will not be discommoded; nor will the state. It will be the people who pay the gas company, who have piped their homes and furnished the equipment at the expense of millions, that will be damaged by the withdrawal of the service.....We think that the city of Cleveland and the state of Ohio were both entitled to the relief they seek by injunction, and are entitled to a perpetual injunction to prevent the East Ohio Gas Company from withdrawing its service from the City of Cleveland without first making an application and obtaining the consent of the Public Utilities Commission of Ohio."

Ordinance Restricting Gas Rates

Generally speaking, the power to regulate rates to be charged by public utilities is a power residing primarily in the state, and no city or subdivision of the state can exercise such power unless it is authorized so to do by the state laws. If the state has not conferred that power upon cities of a special class, then an ordinance regulating the rates to be charged for gas is invalid. Also, the fact that a gas company's charter gives it a right to charge the present prices for gas being paid by consumers does not prevent a city council from enforcing reasonable rate laws, if such laws are authorized by the state statutes. So held the United States Court in the recent case of Kentucky Power & Light Co. V City of Maysville, 36 F. (2d) 816.

In this case it was disclosed that the Maysville Gas Company was organized to furnish gas for lighting purposes by an Act of the General Assembly of Kentucky of March 1, 1854. Its charter provides:

"That said company may lay their pipes of every necessary kind, through any of the streets and alleys of said city, and furnish gas light to any person on such terms as the company and such person may agree upon....."

In 1886 the Citizens' Gas Light Company was created by an Act of the General Assembly and its charter authorized the company to furnish gas for all purposes and "to furnish gas and gas light to the City of Maysville and the Town of Chester *by contract with them.*"

Under these charters these two companies laid their gas lines and commenced the conduct of their business in the city of Maysville and subsequently by amendments and consolidations under the the laws of Kentucky they were finally merged in the Kentucky Power & Light Company.

The Kentucky state laws authorize the council of each city to provide the city and the inhabitants with water, light, power, heat and telephone service and to fix and regulate the prices to private consumers and customers.

In 1929 the council of Maysville passed an ordinance making it unlawful for the gas company to charge for gas more than 40 cents per 1,000 cubic feet. The gas company filed suit to prevent enforcement of the ordinance on the grounds that the council of the city of Maysville is without any authority under the laws of Kentucky to regulate the price at which gas may be sold to consumers within the limits of that city, and that the ordinance is void because its enforcement would deprive the gas company of its property without due process of law.

The counsel for the gas company further argued that the provisions in the charters, which gave the company the right to supply gas at any price contracted by users, prevented the city from limiting the rates charged for gas, although the above mentioned law delegated that power.

However, the Court held the city within its rights to enact a reasonable ordinance restricting the gas rates. This Court said:

"The power to regulate rates of public utilities is inherent in every sovereignty. It is legislative in character and is a part of the police power. The state may, within limits, contract with a utility as to the rates to be charged, yet it may well be doubted if, under the modern rule, it can irrevocably surrender all regulatory power. Certainly no such surrender is to be presumed. On the contrary, every presumption is against any such surrender. A charter provision claimed to work such a surrender must not be so construed if any other construction is reasonably possible.....At most, the two charter provisions relied upon in this case simply authorized their recipients to make and enforce contracts for supplying gas to consumers. Inasmuch as these companies were engaged in a business affected with a public interest, the provisions of their charters cannot be construed as giving to them the unrestricted right to charge whatever rate they might choose.....It does not seem to me that the two charter provisions relied upon irresistibly compel the conclusion that it was the intention of the General Assembly to forever surrender the power of the state, by legislative action, to regulate the rates of the two companies referred to, and to leave the question of the reasonableness of such rates to be dealt with by the Courts as the occasion might arise. A more reasonable construction is that these two charter provisions conferred upon the two corporations the right to make valid and enforceable contracts as to the rates to be charged, subject always to the rate-regulatory power of the state."

Perpetual Franchise Held Invalid

Numerous Courts have held that any state law is invalid which, in violation to a provision in the state constitution, grants a perpetual franchise or its equivalent.

For illustration, in City of Okmulgee V Okmulgee Gas Co., 282 Pac. 640, a recently enacted state law provided:

"Any corporation, now or hereafter engaged in the business of furnishing power, light, heat or gas, electricity or water as a public utility in any city or town in this state under a municipal franchise now in existence or hereafter granted, may at any time before the expiration of such franchise.....surrender such municipal franchise for the purpose herein provided; and in consideration, the utility surrendering the same shall, by operation of law, receive in lieu of such surrendered franchise, a permit from the state revocable only in the manner hereinafter provided, granting to such utility the right, until such permit shall be so revoked, to conduct the same business in such municipality and enjoy the use of the streets, alleys and public grounds or ways in the municipality for that purpose and upon the terms and conditions of said surrendered franchise except as to its period of duration, subject to the lawful police regulation and control of such municipality.....Any permit granted under the provisions of this Act may be altered, amended, annulled, revoked, or repealed by enactment of the Legislature of Oklahoma whenever in its opinion such permit may be injurious to the citizens of this state; in such manner, however, that no injustice shall be done to the holder of such permit."

The law permits a public utility operating under a franchise granted by the municipality to surrender the franchise and receive in lieu thereof the permit under which it operates thereafter, with precisely the same terms and conditions as to the original franchise except as to the period of its duration. In other words, where the original franchise might have had one, ten, or twenty years to run according to its term, the new permit runs for an indeterminate time, subject to being altered, amended, annulled, revoked, or repealed by the Legislature.

The state constitution provided:

"No franchise shall be granted, extended, or renewed for a longer term than twenty-five years."

The validity of this law was attacked on the grounds that it was in effect a perpetual franchise. In upholding this contention, the Court said:

"All of the authorities that we have been able to find hold that, where a franchise is not limited in its existence to a fixed and definite period of years, then the same is a perpetual franchise..... The constitution not only placed a limitation against the Legislature from granting a monopoly or exclusive rights, but also forbade the municipalities that were authorized to grant a franchise by popular vote, from granting any such privilege or monopoly. Of such tremendous import did this question become, that there was inserted a declaration in the Bill of Rights providing 'that perpetuities and monopolies are contrary to the genius of a free government and shall never be allowed'.....It will be noted that the act does not give the Legislature power to grant, extend, or renew, but specifically limits the power of the Legislature to alter, amend, annul, revoke, or repeal such permit, when in its opinion such permit may be injurious to the citizens of this state, and then in such manner that no injustice shall be done to the holder of such permit.....The revocable permit is simply a perpetual franchise which may be altered, amended, annulled, or revoked by the Legislature of Oklahoma only whenever in its opinion such franchise may be injurious to the citizens of the state."

Rule of Interpreting a State Law or Constitution

Numerous Courts have held that in construing a state law, or a provision of a constitution, the object is to interpret the intent of its framers, and of the people who adopted it. Generally speaking this intent is to be found in the instrument itself. Moreover, when the text of a constitutional provision is not ambiguous, the Courts, in construing it, are *not* at liberty to search for its meaning beyond the instrument.

In order to correctly interpret the true thought or meaning, expressed in a statute or a constitution, the first consideration is reference to the natural signification, or order of the grammatical arrangement of the clauses. If the words convey *definite meaning,* which involves *no absurdity or any contradiction* of other parts of the instrument, then that meaning, *apparent on the face of the instrument,* must be accepted. Neither the Courts nor the Legislature have the right to add to it or take from it.

Therefore, it is quite apparent that it is not to be presumed that a prevention was inserted in the constitution or statute without good reason, or that a result was intended by its framers inconsistent with the judgment of men of common sense, guided by reasons. (288 Ill. 327.)

It has long been recognized that the people are superior to the constitution, subject to it and all its parts while it is in force, but possessed of the undoubted right to change, alter, or amend it at their own will in any of the regular ways provided by constitution or laws. In other words, the power to make changes in the organic law is one belonging peculiarly to the people. (178 Ind. 336.)

A constitution is a Magna Charta of the people's rights, the fundamental law of the land, intended, *not* for short periods of time, but for all time.

What Is Franchise?

For these reasons the validity of franchises always depends upon whether their provisions are authorized by the state constitution when read and construed in accordance with the intended meaning of the framers.

A franchise has been defined as follows:

"A franchise is a right or privilege granted by the soverignty to one or more parties to do some act or acts, which they could not do without this grant from the sovereign power." (106 P. 962.)

Also, in Sapulpa V Oklahoma Natural Gas Co., 79 Okl. 196, it was held:

"A municipality, in granting a franchise to a gas corporation, which permits the use of the streets and alleys for the purpose of furnishing the citizens with gas, acts as a governmental agency of the state."

While a state Legislature should not grant to any citizen privileges or immunities which shall not equally belong to all citizens, it may, directly or indirectly for the public welfare, grant or withhold franchises for the use of the public streets. In thus exercising its police powers, the state may make discriminations and distinctions, and judge of the reasonableness thereof.

Monopolistic Franchise

On the other hand, it is important to know that in the leading case of Cedar Rapids V Cedar, 118 Iowa 234, the Court said:

"Grants of franchises in perpetuity or for unreasonably long periods of time are generally regarded as against public policy, and, if ever valid, the authority therefor must be found in the cocnstitution or statutes of the state."

Generally speaking, the Federal and State constitutions impose upon legislative bodies the duty to protect the citizens against monopolies, trusts, and unlawful combinations.

Various Courts (125 Ky. 677) have held that no more important obligations are imposed upon a legislative body than that of shielding the citizens against extortion in matters of public necessities. No higher duty than that of opening the doors to the fullest competition in such matters.

City Not Liable for Injuries Caused by Fire Department Vehicles

Since gas company employes frequently find it necessary to work in city streets when laying or repairing pipes and their connections, it is important to know that the overwhelming weight of legal authority is to the effect that a municipal fire department belongs to the governmental branch of the municipality, and the city is not liable for injuries resulting from the maintenance and operation of its fire department, although the injuries are negligently effected.

For instance, in the recent case of Barcus V Coffeyville, 282 Pac. 698, it was proved that a fire truck was being driven on the wrong side of the street and that it collided with a person causing his death. The dependents of the man who was killed sued the city for damages.

The sole question presented the Court was whether the city was liable for the negligence of its fire department employes. After thoroughly reviewing the testimony the Court held the city not liable, and said:

"The general rule, well settled in this state and elsewhere, is that in the performance of governmental functions neither the state nor any of its political subdivisions is liable in damages for the negligence of its officers.....In the maintenance and operation of its fire department, a city acts in its governmental capacity.....The power conferred by the statute, on cities of this state, to organize and regulate fire companies, and provide engines, etc., for extinguishing fires, is, in its nature, legislative and governmental; and a city is not liable to individuals for damage resulting from a failure to provide the necessary agencies for extinguishing fires, or from the negligence of officers or other persons connected with the fire department."

Successful Third Annual Domestic Gas Appliance Course

FOR the third consecutive year an interesting and instructive training course dealing with the various phases of the domestic utilization of gas was held at the American Gas Association's Testing Laboratory at Cleveland, Ohio. This course, although sponsored primarily for the benefit of home service workers, has been found to be of special interest and value to service men, home economic teachers, and others interested or engaged in home economics work.

Among those attending this year's course were twelve home service representatives of gas companies, twelve gas company service men, three engineers from manufacturers of gas appliances, two representatives of national retail stores, three home economics experts from appliance manufacturers, two home economists representing manufacturers of baked goods and baking products, one representative of manufacturers of cooking utensils and kitchenware, one University teacher, one women's magazine writer, and the Home Service Counsellor of the American Gas Association.

Others in attendance included two from Texas, one from Florida and one from Wisconsin, while several came from such eastern points as New York, Brooklyn, Philadelphia and Syracuse. In all, there were representatives from nine different states present.

The course was opened with an address of welcome by C. T. Henderson, General Sales Manager of The East Ohio Gas Company, Cleveland, Ohio. The balance of the first day was devoted to an address on "What Service Workers and Home Economics Teachers Need to Know About Gas" by N. J. Reiff, A.G.A. Laboratory Testing Engineer in charge of the course; an address by Miss Dorothy Shank, Director Research Kitchen, American Stove Company on "The Application of Heat to Various Foods in Baking"; and the showing of two very interesting and instructive moving films on field production from a series of films on the story of natural gas, produced by the Ohio Fuel Gas Company.

Miss Shank's talk was especially interesting since many of the questions often raised by housewives in regard to the use of gas for cooking were clearly explained. The three methods of heat transfer were briefly discussed along with the nature of

the heat transfer in ovens. The talk also included a discussion of the various kinds of food materials, the effects of long and short periods of heating of various foods, the effects of temperatures upon foods, together with a summary of the results to be expected when using different types of cooking utensils for similar operations.

Tuesday's program included an address by R. H. Conner, Director, A.G.A. Testing Laboratory, on "The Home Service Worker's Place in The Industry," a lecture on "Gas Range Thermostats" and one on "Water Heaters, Types and Design" by W. R. Teller and F. Rutherford respectively, Laboratory Testing Engineers; an address on gas refrigerators and a demonstration of the action of the various controls by W. S. Walker, Utilization Engineer, Consolidated Gas Company of New York; and an address by F. A. McFerran, Ruud Water Heater Company on "Water Heater Service Conditions."

Much interest was created by Mr. Walker's demonstration as to the action of the two thermostatic devices, one of which maintains the proper degree of coldness within the refrigerator and the other which shuts off the gas supply to the small burner when the water supply fails.

The first lecture on Wednesday was given by Major W. E. Stark, Research Engineer, Bryant Heater & Manufacturing Co., on the subject of "Central Heating and Cooling for the Home." The lecture was illustrated by use of a series of lantern slides. Other addresses and lectures given on Wednesday were—"Home Service as a Sales Activity" by B. H. Gardner, Director of Sales, Columbia Engineering & Management Corporation; "Design and Performance of Gas-Fired Incinerators" by W. Smith, Laboratory Testing Engineer; "Merchandising Incinerators" by W. R. Lacey, President, Kermit Incinerator Co.; "Space Heaters, Various Types and Their Comparative Advantages" by K. H. Flint, Chief Inspector, A. G. A. Laboratory; and "Effect of Change-Over from Manufactured to Natural Gas" by F. E. Vandaveer, Supervisor, A. G. A. Laboratory.

Address by Milener

Thursday's and Friday's programs included addresses and lectures by E. D. Milener, Industrial Research Representative of the American Gas Association, on the subject of "What the Bakeries Are Doing to Increase Their Business in Bread and Fancy Goods"; "The Business of Home Service" by Miss Jessie McQueen, Home Service Counsellor of the American Gas Association; "Gas Ranges, Their Design and Operation" by C. S. Stuckenholt, A. G. A. Laboratory Foreman; "The Use of Portable Gas and Butane-Air" by W. P. Cook, A. G. A. Laboratory Testing Engineer; "A Comparison of the Relative Costs of Gas and Electricity for Domestic Cooking and Water Heating Purposes" by K. R. Knapp, Chief Engineer, A. G. A. Laboratory; "Home Service and The Homemaker" by Miss Karen Fladoes, Chairman of the A. G. A. Home Service Committee, Equitable Gas Company of of Pittsburgh; and "The Significance of The A. G. A. Laboratory Approval Seal" by F. R. Wright, Publication Editor, A. G. A. Laboratory. A part of Thursday following the lecture on gas ranges was devoted to practical work in the adjustment of various types of appliances and controls, while the latter part of Friday afternoon was occupied by a trip through the Laboratory.

Gas Appliance Class in Session

The program Saturday morning included a lecture on Clothes Dryers by W. Smith, A. G. A. Laboratory Testing Engineer; and addresses by W. P. McCoy, General Sales Manager, Judelson Dryer Corporation on "Gas-Heated Clothes Dryers, The Modern Way of Drying Clothes"; and "Chimney Conditions and Ventilation" by J. Corsiglia, Assistant Chief Engineer, A. G. A. Laboratory. Facts about the use and advantages of modern incinerators and clothes dryers were presented from new and interesting angles by W. R. Lacey, and W. P. McCoy respectively.

The following statement was made by Miss Karen Fladoes in the course of her talk on "Home Service and The Homemaker"—"To launch a new housekeeping technique for homemakers is analogous to the launching of any new business. It must prove its worth, and to be entirely successful must meet a real need. The gas company must, through its home service department, study the problems of the housekeeper, find solutions for her, and then convey this information to her, not only telling her the things she wants to know but also making her want to learn what she ought to know."

Those attending the course were as follows:

L. L. Anderson, East Ohio Gas Company, Cleveland, Ohio; E. G. Austin, East Ohio Gas Company, Cleveland, Ohio; Frieda Barth, Detroit City Gas Co., Detroit, Mich.; Thelma Brown, Fla. Power & Light Co., Lakeland, Fla.; Lee Corn, East Ohio Gas Company, Cleveland, Ohio; Claire Dennen, Sears, Roebuck & Co., Chicago, Ill.; Wm. T. Doolittle, East Ohio Gas Company, Cleveland, Ohio; Alice B. Fitzgerald, Brooklyn Borough Gas Co., Coney Island, New York; Lawrence E. Gleuck, Cleveland Heater Co., Cleveland, Ohio; Martha Louise Grant, The Brooklyn Union Gas Co., Brooklyn, N. Y.; Paul B. Harner, Union Mfg. Co ., Boyertown, Pa.; Mary Irene Hart, Aluminum Goods Mfg. Co., Manitowoc, Wis.; Elsie E. Hinkley, The Tappan Stove Co., Mansfield, Ohio; J. Lithgrow, Sears, Roebuck & Co., Chicago, Ill.; F. M. Miller, East Ohio Gas Company, Cleveland, Ohio; L. C. Minnie, East Ohio Gas Company, Cleveland, Ohio; Joe C. Morris, Dallas Gas Co.; Dallas, Texas; Marian Mundhenk, Ohio Fuel Gas Co., Columbus, Ohio; Nell B. Nichols, Woman's Home Companion, New York City; J. E. Nimmo, East Ohio Gas Company, Cleveland, Ohio; L. E. Offutt, East Ohio Gas Company, Cleveland, Ohio; W. F. Pearson, Dallas Gas Co., Dallas, Texas; Harvey W. Reichard, Union Mfg. Co., Boyertown, Pa.; Jane L. Roberts, Roberts & Mander Stove Co., Philadelphia, Pa.; H. W. Schmitt, East Ohio Gas Company, Cleveland, Ohio; C. M. Scott, East Ohio Gas Company, Cleveland, Ohio; Prudence Stevens, Syracuse University, Syracuse, N. Y.; Frances Stout, Brooklyn Borough Gas Co., Coney Island, N. Y.; Elizabeth Sweeney, Associated Gas & Elec. Co., Geneva, N. Y.; Ruth H. Tuck, The Phil. Gas Works Co., Philadelphia, Pa.; Lola M. Tyson, Detroit City Gas Co., 415 Clifford St., Detroit, Mich.; Rebecca Yauger, Ohio Fuel Gas Co., Columbus, Ohio.

Visitors Included:

Margaret B. Baker, Russell Miller Baking Co., Minneapolis, Minn.; Katherine Clayberger, Woman's Home Companion, New York, N. Y.; Karen Fladoes, Equitable Gas Co., Pittsburgh, Pa.; Marie Lloyd, Standard Brands, Inc., Cleveland, Ohio; Jessie McQueen, Ameri-

can Gas Association, New York, N. Y.; Dorothy Shank, American Stove Co., Cleveland, Ohio; Hulda Ungericht, Columbus Gas & Fuel Co., Columbus, Ohio.

Michigan Association Discusses Natural Gas and Other Live Topics

THE Michigan Gas Association in its annual convention at Mackinac Island June 29, June 30, and July 1 gave particular attention to natural gas possibilities in the state and to research studies being conducted at the University of Michigan under the auspices of the association.

Michigan State Geologist R. A. Smith in a paper on "Natural Gas Possibilities in Michigan" detailed the findings of natural gas in Isabella and Clare counties where there are 17 producing wells with a daily gas potential of more than 52,000,000 cubic feet.

James A. Brown of the Commonwealth and Southern Corporation, New York, in a paper on "What It Means to Change Over to Natural Gas," said: "Natural gas has not yet become a problem of much importance in the state of Michigan, but it may become so at an early date."

Therm Rates

On the matter of "therm rates," Mr. Brown said: "In our opinion this is the proper standard to use for making rates to our customers. On the basis that an operating company is entitled to earn a reasonable return on the required investment to furnish the service, it is not likely that the rates can be greatly reduced from the present rates per unit of heat furnished. If the use of natural gas permits the addition of considerable business of various kinds, this additional business, when and if attached, may permit the company to lower its rates for service to the customer."

Professor E. S. Pettyjohn of the Engineering Research Department of the University of Michigan, who for the past four years has been engaged on gas research work under the auspices of the Michigan Gas Association, reported on last year's activities which included: "The Improved Utilization of Oil in the Manufacture of Carbureted Water Gas," "A Study of the Types of Oil Available in Michigan for the Carburetion of Water Gas, with Particular Emphasis on the Utilization of Midland-Mt. Pleasant Crude Oil," and "A Study of the Thermal Conditions in the Water Gas Machine."

His report asserted that Michigan crude oil from the Midland-Mt. Pleasant area can be used to advantage by Michigan gas companies in the carburetion of water gas.

"In the tests," said the report, "the quantity of crude oil required for carburetion was slightly less than the normal quantity. This decrease provided a saving beyond the price differential which existed between the two oils (the other being gas oil). The operating results indicate that when using Midland-Mt. Pleasant crude oil for carburetion, the quantites of both coal and oil used per thousand cubic feet of gas made were below the normal requirement for the plant."

Chairman D. W. Hayes of the Technical and Fellowship Committee also reported on the year's research work. Activities along this line will be continued under association auspices during the coming year. The Michigan Gas Association fellowship at the University of Michigan is now entering its 32nd year.

White Stresses Research

President Alfred H. White in his annual address stressed the importance of research and study in meeting the problems rising out of present business conditions. He said: "We must make a careful survey of what solid construction remains of the business edifice which towered so glitteringly in 1929 and with our eyes to the future instead of the past redesign and rebuild this structure to be adequate to the new conditions which confront us."

Reviewing the gas situation in Michigan, he commented: "The number of customers in Michigan was higher in 1930 than ever before, and the sales of gas were only 4 per cent below the peak of 1929, and were higher than for any other year. There are now 263 Michigan cities, villages, and hamlets supplied with gas."

President Clifford E. Paige of the American Gas Association was an honored guest of the convention. He spoke at a joint session of the Michigan Gas Association and Michigan Electric Light Association on Monday morning.

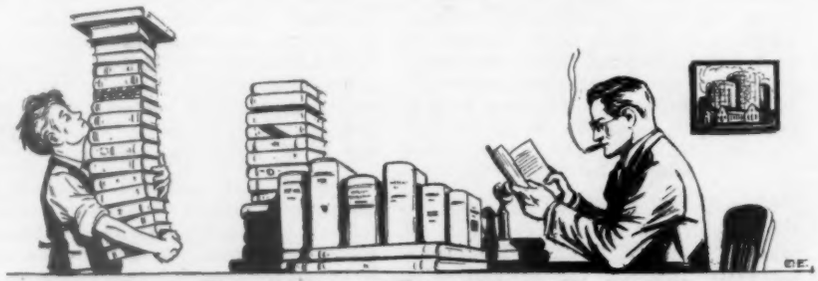
Commenting on the stability exhibited by the gas industry in Michigan during the period of depression, Mr. Paige said: "It is doubtful if the industry could have weathered this period as well as it did were it not for the manner in which companies in this state have modernized and adjusted their rate making policies to conform to present day economic conditions. The Michigan utilities have not only greatly increased the number of rates designed to secure special classes of business, but they have been in the very forefront of progress in introducing rates of a promotional form. This progress in rate making practice might be summarized by the statement that six years ago there were only 12 rates in the entire state which could be called truly promotional in form while today there are some 40 rates which might be classed definitely as of the promotional type.

Increase in Rate Schedules

"Six years ago the total number of general service or domestic rates effective throughout the state numbered 65. There were no house heating, water heating, or similar forms of rate schedules designed to secure these special classes of business. Today while the number of general service or domestic rates is 76, the total number of rate schedules in effect throughout the state aggregates 219."

Other speakers at the joint session were A. C. Marshall, Detroit Edison company, chairman, and Arthur W. Stace, director, Utilities Information Bureau of Michigan.

New officers elected by the association are: President, James E. Spindle, Grand Rapids Gas Light Company, Grand Rapids; vice president, Walter E. White, Consumers Power Company, Jackson; secretary-treasurer, A. G. Schroeder, Grand Rapids.



American Gas Association Proceedings, 1930

American Gas Association, Inc., 420 Lexington Avenue, New York, N. Y. 1929 pages. Price $3.00 to members; $7.00 to non-members.

This volume which records the Twelfth Annual Convention of American Gas Association, held at Atlantic City, N. J., October 13th to 17th, 1930, discusses the problems which are uppermost in the gas man's mind. It not only records the various papers read and the committee reports presented but also contains a wealth of discussion on the part of gas men from many sections of the country. In a sense it is the encyclopaedia of gas company procedure for the year 1930.

The book should be in the possession of literally thousands of gas men for it will unquestionably serve as a guide in the solution of numerous problems which confront the industry. Scores of illustrations add to the value of the text. The various branches of the gas industry are appropriately sectionalized in the book and a roster of committee members are recorded. The index is complete and usable.

The present volume is a credit to its sponsors.

EQUIPMENT NEWS

Roper Announces New Cooking Top on Ultra-Classique Series

The Geo. D. Roper Corp. announces a new model gas range representing a major improvement in gas range design. This model has been called the "Sani-Speed" Top because of its sanitary, full porcelain enameled, easily cleaned, speedily operated cooking top.

The Sani-Speed Top Range has its cooking top enclosed with an enameled cast-iron plate, instead of open grates. Four combustion-chamber-lids (removable for cleaning) set in the top, over the four star burners directing the flame upward. The heat from the burner is delivered up to and concentrated on the cooking utensil above it—rather than spread out under the entire cooking top. The perforated lids are regularly furnished for speedy operation. Solid lids can be furnished, if desired.

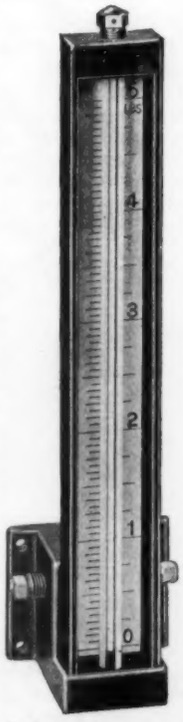
Raised ribs on the cooking top permit easy sliding of kitchen utensils. The cooking top being porcelain enameled will remain permanently smooth. The design is such that the gas valves are permanently easy-working, while the gas valve handles remain cool. Ranges may be had with right or left hand oven.

With the special, fingered, bottom construction of the combustion chamber, the flames from the burner do not strike any obstruction on their way up toward the cooking lid. Each burner is individually and perfectly aerated. Foods spilled onto the cooking top do not affect operation of the burner.

New Mercury Column Gauge

The Amthor Testing Instrument Co., Inc., 309 Johnson St., Brooklyn, N. Y., has recently placed on the market their new Mercury Column Gauge for indicating low pressure and vacuum.

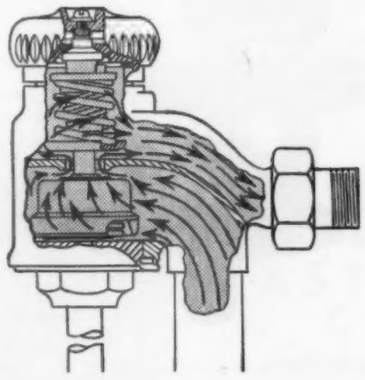
The glass tube is protected from breakage by the U-shaped scale case. Distinct reading is afforded by reason of the white backing of the glass tube. The depressed black graduations and figures against the smooth aluminum finish of the scale present a clear reading, visible from a reasonable distance. All other parts are finished in heavy black enamel.



Any one of the right, left or top connections on the mercury chamber can be used. All three are threaded for ¼ inch standard pipe thread. The pressure gauge shown herewith has its scale graduations in ounces and pounds per square inch. In the case of the vacuum gauge there are a top connection and lower vent plug, the scale graduations being in inches of mercury. Further details will be sent upon request to the manufacturer.

Minneapolis-Honeywell Modustat

The Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. recently issued a catalogue describing and illustrating the "Modustat," a new automatic temperature control device for steam heating systems. The Modustat is an automatic orifice system of individual room temperature control, easily and quickly installed, which regulates the temperature in each room of home or

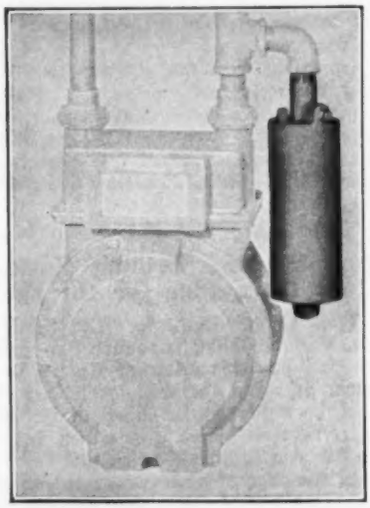


office to the desired degree. For direct radiation the sensitive thermostatic medium of the Modustat is located in the bottom of an extension of the valve casting itself. A baffle, in which a fine hole is drilled, divides the tube into two chambers. The volatile liquid is retained in the lower portion of the tube, only the vapor produced by gasifying the liquid passing through the drilled hole. The baffle virtually isolates the lower chamber in the tube from the upper, and by so eliminating circulation prevents heat transfer from the upper chamber located in the steam space, to the lower chamber located in the air temperature of the room. This insures the accurate response of the Modustat to room temperature changes only, unaffected by steam temperature changes.

The illustration shows how steam flows through the Modustat orifice, which automatically modulates the supply to exactly the amount needed to offset heat losses and keep room temperature uniform. Copy of catalog will be mailed on request.

Natural Gas Detector

The Reliable Meter Co., Houston, Texas, announce a practical inexpensive device for detecting natural gas on the consumers premises.



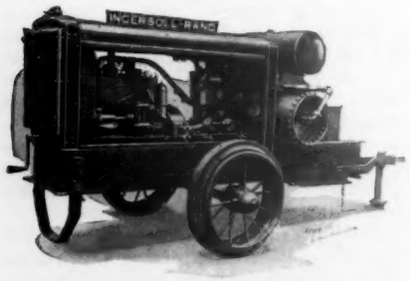
It is designed to completely and continuously odorize natural gas at the outlet side of the meter, thereby eliminating any evil effects from the injection of volatile odorant oils into the mains and particularly through the meters. It preserves an outstanding advantage of natural gas—that of the long life meter system.

Descriptive details will be mailed on request.

New I-R "Speed Trailer" Portable Air Compressor

The "Speed Trailer," a portable air compressor designed for high-speed towing, is a new addition to the Ingersoll Rand line. It consists of a standard 5½ x 5-inch gasoline-engine-driven compressor mounted on two rubber-tired steel wheels. Because of the low center of gravity, it can be towed behind a truck on a good

roadway at 30 to 35 miles per hour. When detached, it can be moved about by one man. It is especially adapted to quick service jobs by public utility companies, street departments, etc.



The steel frame forms a tool box 6 by 2 feet, providing ample room to carry all the tools and accessories ordinarily used with this size of compressor. This leaves the truck or other towing vehicle free to serve its usual purpose.

The complete "Speed Trailer" is 13 ft., 10 ins. long; 6 ft. wide; and 5 ft., 9 ins. high. It has a piston displacement of 120 cu. ft. per minute and is designed for a working pressure of 100 pounds per sq. in. Removable steel side doors permit enclosing and locking the unit when it is not in use.

Operating features include an "airsealed" compressor unloader, "airsealed" engine speed controller, aftercooler, and Type "K" plate valves. Complete information may be obtained from Ingersoll-Rand Co., 11 Broadway, New York City.

Pumping and Drilling Engines Now Convertible for Oil Fuel

The Cooper-Bessemer Corporation, Mt. Vernon, Ohio, announce that present and earlier models of Cooper-Bessemer pumping and drilling engines can now be equipped for burning oil fuel in territories where gas either is not available or is limited in supply.

In the case of new two-cycle engines (Types GA and OF), they can be factory-equipped for oil burning. Gas engines now in the field can be quickly converted by use of a replacement cylinder head, fuel-oil pump, and other necessary parts. Such oil-fueled engines can, of course, be converted back to gas at any time.

The new cylinder head looks like the gas-engine head. It has a somewhat smaller clearance to give the necessary high compression, and the large hot tube is on the bottom.

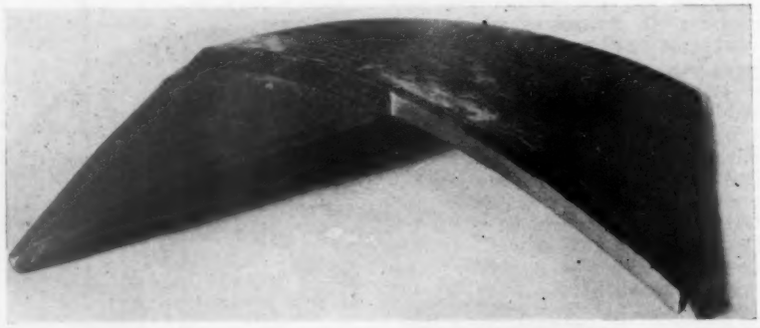
Fuel-pump valves and by-pass are hardened-and-tempered drop forgings with ground finish on all working surfaces. They operate in removable seats of the same quality and are designed for long life and low cost of replacement. The rest of the pump has equal endurance.

The spray valve is of the spring-loaded differential plunger type, suitable for variable-speed work and heavy fuels.

In the case of four-cycle (Type FC-E) gas engines now in the field, conversion of the 30 and 40-horsepower sizes is accomplished most economically by substituting two-cycle cylinders with oil-burning heads.

Armco Spiral Welded Pipe

The American Rolling Mill Co., Middletown, Ohio, are placing on the market a spiral welded pipe. In describing the process of manufacturing this pipe they say: "The manufacture of spiral welded pipe is continuous. The long coils of iron or steel strip are placed in a decoiling device on one end of the pipe machine, which is one compact self-contained production unit.



There the coil is unwound and flattened. Then it proceeds through the forming rolls and is welded. The spiral seam is produced by feeding the strip into the machine at an angle of approximately 45 degrees. The great length of the coils or metal eliminates the necessity for frequently stopping the machine to add new stock. A cut-off mechanism synchronized with the speed of the welded pipe assures accurately gaged lengths.

Then follows inspection and testing. The pipe is next taken directly to a monster testing machine where it is subjected to tremendous hydraulic pressure. Standards of testing have been established so the pipe is tested at twice the safe working pressure. The latter is determined by using a fibre stress based on the ultimate tensile strength, using a factor of safety of four."

The pipe is made in lengths up to 40 feet in sizes from 6" to 24" in diameter and in wall thickness from 12 gage to ¼ or ⅜ inch.

Johnson Jr., Conversion Burner

The Johnson Gas Appliance Company of Cedar Rapids, Iowa, has recently made an interesting addition to their line of gas heating burners, in the form

of the Johnson Junior. While the Johnson Junior was designed expressly to satisfy the demand for a low-priced burner the manufacturers claim that efficiency and dependability have not been sacrificed in the least degree. It is more simple—lighter in weight—less handsome—but all the important patented Johnson features have been retained. Another important advantage of the Johnson Junior set-up is the fact that the burner may be purchased stripped or with any optional equipment needed. Optional equipment includes—safety pilot, pressure regulator, radiant, brick, and thermostatic, remote (chain) or manual control valve. A data sheet covering the complete Johnson line of Johnson Conversion Burners will be sent to interested parties on request.

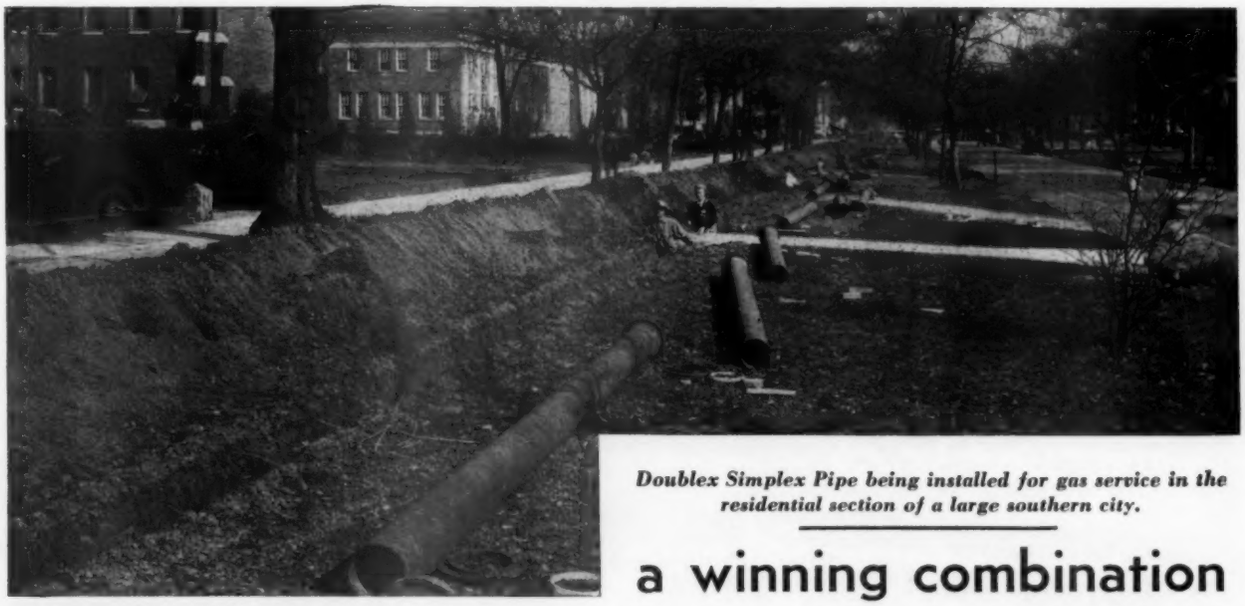
New Prest-O-Weld Cutting Apparatus Introduced

The Linde Air Products Company, 30 East 42nd Street, New York, N. Y. has recently added a cutting blowpipe and cutting attachment to its new line of Prest-O-Weld medium-pressure apparatus of the detachable valve body design. The new cutting apparatus includes the Prest-O-Weld Type C-105 Cutting Blowpipe and the Prest-O-Weld Type CW-105 Cutting Attachment.

By means of the detachable valve body, the operator can change easily and quickly from a full size welding blowpipe to a smaller welding blowpipe, to a full size cutting blowpipe, or to a

(Continued on page 284)

DOUBLEX SIMPLEX CAST IRON PIPE



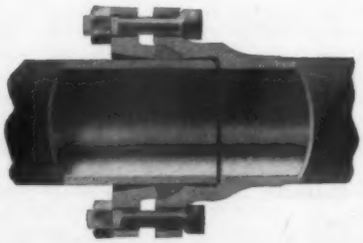
Doublex Simplex Pipe being installed for gas service in the residential section of a large southern city.

a winning combination that's winning new friends for ACIPCO!

For years the gas industry needed a corrosion-resisting pipe that would carry high pressures and not leak or blow out at the joints. Two major developments in cast iron pipe manufacture met this demand: pipe centrifugally cast in refractory molds, and a joint embodying the stuffing box and gland principle. Doublex Simplex Pipe combines these two developments. It is a high-presure cast iron pipe, made by the well-known Mono-Cast centrifugal method, equipped with the Doublex Simplex Joint (see cross-section diagram) which withstands extreme pressures and remains permanently bottle-tight while allowing maximum deflection in the line. Furnished in lengths up to and including 16 feet, it is quickly, easily, economically laid. Made of cast iron only one degree removed from its natural state, it will last for centuries. A new, comprehensive, illustrated catalog fully describing Doublex Simplex Pipe will be mailed you free on request. Address Acipco office nearest you.

DOUBLEX SIMPLEX JOINT

withstands high pressures and remains bottle-tight under repeated deflections



AMERICAN CAST IRON PIPE COMPANY

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318G

NEWS of the GAS INDUSTRY

Approve Construction of Two Butane Gas Plants

The New York Public Service Commission has approved the construction by the Central Hudson Gas & Electric Corporation of two butane-air gas plants, one to supply the town and village of New Paltz and the other to supply the town of Marlborough.

The New Paltz plant will have a capacity of 156,000 cubic feet per day and will cost $23,000. The distribution system will cost $52,254, making a total investment of $75,254. The company estimates that at the end of five years it will be selling 19,542,000 cubic feet per year to 338 customers producing an annual revenue of $27,923, which will be a return of 5.12 per cent on the investment.

The Marlborough plant is of the same size and will cost the same amount. In addition, however, there is to be a transmission line from Marlborough to Milton estimated to cost $26,897, which with the distribution system in Milton costing $8,864 and that in Marlborough costing $21,940, makes the total investment $100,003. The company estimates that at the end of a five-year period it will be selling 21,040,000 cubic feet per year to 435 customers, which will give a return of 1.97 per cent on this investment.

New Corporation Formed

Articles of incorporation have been filed with the secretary of state of Indiana by the American Public Service Corporation having a principal place of business in Indianapolis. The corporation has an initial capital stock of 5,000 common having no declared par value and is formed to hold stock in various public utility companies. The first board of directors is composed of Thomas N. Wynne, Otto Kafka and Hazel Wynne.

Amarilloan Heads Gas System

R. E. Wirtz, president of the Amarillo Gas Company of Amarillo, Tex., has been appointed operating manager of the Southwestern Development Company, a firm furnishing gas to forty-eight towns in West Texas and Eastern New Mexico, taking in the area extending from Clayton, N. M., to Midland, Texas

The company was organized four years ago through the efforts of V. A. Hays of Independence, Kans., who, upon completion of his work, resigned as operating manager to return to Independence. He is still associated with the firm, though not in an active position.

The Southwestern Development Company represents an investment of $9,000,000, and owns all pipe lines, plants and distribution systems used in its operation. It employs six hundred persons.

Mr. Wirtz will also continue as president of the Amarillo Gas Company.

File Articles of Incorporation

Articles of incorporation have been filed with the secretary of state at Indianapolis, Ind., by the Carrollton Gas Company, Inc., having a principal place of business at Vevay, Ind. The corporation has an initial capital stock of 2,000 shares and is formed to deal in natural and artificial gas. The first board of directors is composed of Martin R. Rice, C. S. Culbertson, Randall McFarlan, L. H. Emerson and W. P. Truitt.

Gets Pipe Line Contract

The Sheehan Pipe Line Construction Company of Tulsa, Oklahoma, were given the contract to build the laterals for connecting the cities of Jacksonville, Decatur, Champaign, and Danville, Illinois, with the Panhandle Eastern Pipe Line which carries natural gas from the Texas panhandle to Illinois and Indiana. The service to the cities named is to start on or about August 15.

Southern Natural Gas Corporation Signs New Contracts

Southern Natural Gas Corporation reports that new contracts for natural gas have recently been signed which, it is estimated, will increase annual sales of gas by 698,000 MCF and gross revenues by approximately $100,000.

Engineers of the company are working out details for the use of natural gas by a large number of other industrial customers and it is expected that additional contracts will be signed within the near future.

Because the cost of gas remains constant and little additional expense is involved in the transmission of increased volume, almost all of the gross revenues from such additional sales will accrue to the stock.

To Construct Butane Air Gas Plant

The New York Power & Light Corporation has been granted permission to extend its gas system for the furnishing of gas in the town of Canajoharie and villages of Canajoharie and Palatine Bridge, Montgomery County, New York, and to exercise franchise granted by the local authorities. The company will construct a butane air gas plant in the town of Canajoharie at a cost of about $25,000 with a distributing system extending through a portion of the town and through the villages of Canajoharie and Palatine Bridge at an estimated cost of $70,000, with an additional $10,500 for laterals and services. Two units of the plan will have a capacity of 200,000 cubic feet per day.

Memphis Natural Gas Sales Up 16%

Memphis Natural Gas Company, affiliate of Appalachian Gas Corporation, reports sales of 9,637,542,700 cubic feet of natural gas for the twelve-month period ended May 31, 1931, against 8,264,895,500 cubic feet for the preceding twelve-month period, a gain of 16.6 per cent. The company, which owns a 210-mile pipeline extending from the Monroe field of Louisiana to Memphis, Tenn., with a hundred mile extension under construction to Jackson, Tenn., sells gas under long-term contracts to Memphis Power and Light Company, Mississippi Power and Light Company, Arkansas Power and Light Company and Louisiana Power and Light Company and has entered into contract to sell to West Tennessee Power and Light Company.

Greenwich Gas Company Reports High Meter Gains

Over 4,500 gas meters, serving approximately 25,000 people who are largely dependent on gas for cooking, heating, refrigeration, incineration, commercial and industrial uses, have been installed in Greenwich, Conn., since 1926, when work was started on the laying of gas mains, according to statement of E. F. Putnam, president and general manager of Greenwich Gas Company, subsidiary of Greenwich Water & Gas System, Inc., on the occasion of the company's fifth anniversary.

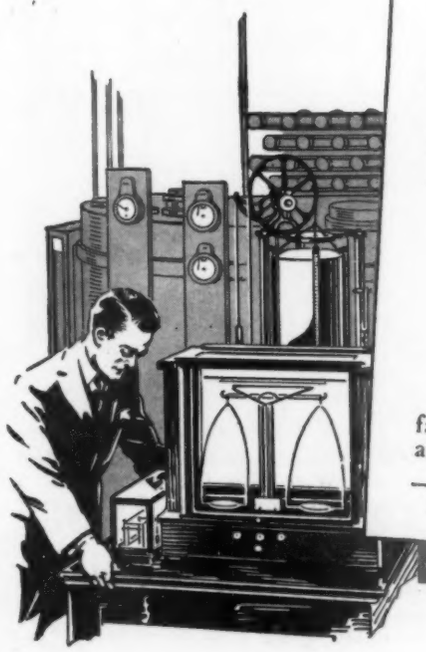
Suit Instituted Against Utility on Sale of Appliances

Suit has been started by the Attorney General of Texas, James V. Allred, against the San Antonio Public Service Company, seeking revocation of their charter on the grounds that this firm is engaging in the retail sale and distribution of gas and electric household appliances contrary to the terms set forth in their charter. This is the first suit of this kind started in Texas, although the Attorney General has reported that, should this one prove successful, similar suits against other Texas utility firms will follow.

(News Continued on page 70)

Effective Research

DEMANDS CONTINUOUS VIGILANCE



THE DEGREE OF PRECISION DESIRED

It has been the aim to reduce the difference between the high result and the low result, derived from a series of tests of the same equipment under similar conditions, to 0.1 percent. In order to obtain this degree of precision, it becomes evident that the average value of many of the individual factors which enter into the tests shall not have an observational error of 0.01 percent. Values equivalent to 0.01 percent of the average reading of orifice coefficient test factors are:

1. Barometric pressure	0.003	inch of mercury
2. Time for 10 minutes	0.06	second
3. Tape reading, seven feet	0.008	inch
4. Prover temperature	0.05	degree F.
5. Prover pressure, absolute	0.04	inch of water
6. Water vapor	0.025	percent
7. Line temperature	0.05	degree F.
8. Line pressure, absolute	0.04	inch water
9. Differential at four inches	0.0004	inch

The result depends upon the differences in readings of the first four factors, and therefore the cumulative error of the readings at the start and finish of a test should not exceed the values given above.

—*From page 7 of* Bulletin E-1 *descriptive of the Erie Laboratory. This table forcibly demonstrates the high precision sought and attained.*

SINCE 1912 the Erie Laboratory of American Meter Company has been devoted entirely to research, specializing in high-pressure measurement. Tangible results of practical as well as of theoretical value to gas measurement engineering have been continuously produced.

These results are embodied in bulletins published from time to time by American Meter Company. Familiarity with these findings can frequently prevent duplicated effort in experimental research.

That is why we ask you to submit your measurement problems. Both of us benefit. Our experimental work has profited greatly from the interest and helpful suggestions of executives and engineers in the Gas Industry.

AMERICAN METER COMPANY
INCORPORATED
The World's Largest Manufacturers of Gas Meters and Allied Apparatus
ESTABLISHED 1836
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JOHN J. GRIFFIN & CO. Est. 1859 · HELME & MCILHENNY Est. 1848 · D. MCDONALD & CO. Est. 1855 · METRIC METAL WORKS Est. 1888
MARYLAND METER WORKS Est. 1866 · NATH. TUFTS METER WORKS Est. 1860 · PACIFIC METER WORKS Est. 1901

Modern Stations Emphasize Service

Following on the heels of the announcement of a "million-dollar" compressor station at Blackwell, Okla., came the news of a similar project at Drumright, Okla.

Both stations were designed by the Cities Service Gas Company and were completed in a remarkably short time. Approximately 175 men were employed in constructing the plant at Blackwell. The layout at Drumright is practically a duplicate.

Of particular significance to the gas industry is the emphasis placed on service to gas-company customers. Seemingly no modern facility is lacking. The buildings were exceptionally well planned and erected—at a minimum of expense, however, for that class of work. Frills and useless material were omitted. Equipment was chosen on the principle that whatever brings efficient operation brings economy, too.

Cooper-Bessemer compressor units at Drumright take gas from the field lines and deliver it into the Cities Service Gas Company's main transmission system. Equally large compressor units at Blackwell handle gas from the field, including the Oklahoma City field, sending it into the main arterial system of the Company. Main trunk lines transport the gas to many cities and towns in Oklahoma, Texas, Kansas, Missouri and Nebraska.

Drumright station has four; Blackwell has five 1000-horsepower Type-22 twin-tandem, double-acting gas-engine compressor units. Auxiliary power for each main plant is provided by two 190-horsepower Type-80 gas engines which direct-drive 120 kw., 150 K.V.A., three-phase, 60-cycle A.C. generators.

The current generated goes to electric motors which drive cooling-water pumps and starting-air compressors. Current also furnishes lighting for main and auxiliary buildings, the office and community-club building, the superintendent's cottage and other dwellings.

Other facilities in the auxiliary building are: boilers for furnishing steam heat; machine shop with lathe, power saw, shaper, drill press and other necessary tools; locker rooms and wash rooms for the station attendants.

Celebrate Opening of New Gas Plant

Opening of the new $250,000 gas plant of the Western Gas Company of Washington marked a new epoch of city growth at Bremerton recently which was welcomed with a civic holiday. Official ceremonials of turning on the gas mains were shared by Mayor J. A. MacGillivray and C. Russ Wood, president of the Chamber of Commerce.

Lloyd M. Longan, manager, and his staff were taxed to the utmost in handling the huge crowds.

Convention Calendar

August

10-25 The Industrial Institute, Silver Bay of Lake George, N. Y. Charles R. Towson, Secretary, 347 Madison Ave., New York.

September

Aug. 31-Sept. 5 Pacific Coast Gas Association convention, San Francisco, Calif.

10-11 Wisconsin Utilities Association, gas section, Sheboygan, Wis.

10-11 Empire State Gas & Electric Association, annual convention, Hotel Sagamore, Bolton Landing, Lake George, N. Y.

17-18 Manufacturers Section, American Gas Association, Book-Cadillac Hotel, Detroit, Mich.

18-19 Operating division, New England Gas Association (fall meeting), Wendell Hotel, Pittsfield, Mass. P. R. Buchanan, secretary-treasurer.

29-30 Indiana Gas Association, annual meeting, West Baden Hotel, West Baden, Indiana. P. A. McLeod, Secretary-Treasurer.

October

12-16 American Gas Association, Atlantic City, N. J. Alexander Forward, 420 Lexington Ave., N. Y. C., managing director.

November

16-21 Third Annual Conference on Bituminous Coal, Pittsburgh, Pa.

The new property of the Western Gas Company is a subsidiary of the Public Utilities Investment Company with headquarters in Salina, Kansas, of which Nathan L. Jones is president. C. B. Shaklee is general manager of the Western group.

Voluntary Rate Reduction Results in Additional Business

Reports from Oklahoma indicate further additional business as a result of the voluntary rate reduction, put into effect July 1st, by the Oklahoma Natural Gas Corporation.

At Sapulpa, where there is a competing gas company, 21 consumers in one week, with an estimated annual consumption of 1,045,000 cubic feet, arranged to use Oklahoma Natural service; at Oklahoma City, the Holmes Home of Redeeming Love is now burning gas instead of free coal at an estimated annual rate of 1,280,000 cubic feet, and the Capital Oil and Refining Company, one of the largest consumers in Oklahoma City, has found it advantageous to change to Oklahoma Natural service after using gas from its own well.

At a special meeting held in Morris, Oklahoma, the city council by unanimous vote, passed an ordinance in favor of granting a franchise to the Oklahoma Natural Gas Corporation and called upon the qualified electors of the city to vote on the ordinance.

Employee Training Problems to be Discussed at Rutgers Extension Conference

Utility men will have a special session devoted exclusively to their employee training problems as the outstanding feature of the sixth annual extension conference conducted at Rutgers University, September 10 and 11, by the University Extension Division. Branches of the utility field in all parts of the country will be represented at the New Brunswick conference next September when a large number of the delegates are expected to participate in this part of extension education.

"According to statistics in the hands of the extension division," Professor N. C. Miller, director of the University Extension Division, reported in a recent announcement, "there has been at no time in recent years such a widespread interest in educational programs on the part of utility employees. Indications are that the coming year will show still greater interest in employee training programs. It is for this reason that the extension division has arranged a special conference for utilities, in order to consider the training problems of that industry."

It is advisable to provide early notice of registration in order to facilitate accommodations, the extension division reports.

Election of Officers

Emmett R. Curtin was elected president of the West Ohio Gas Company at a meeting of the board of directors held today. He succeeds his father, E. R. Curtin, who died on June 7.

Frank L. Pringle was elected comptroller of the company. O. L. Smith was elected assistant treasurer and assistant secretary, posts formerly held by Mr. Pringle.

Samuel Insull, Jr., was elected chairman of the company and Robert M. Feustel, vice chairman of the company. William A. Sauer was elected vice president and G. Corson Ellis, assistant to the chairman of the company.

Mr. Feustel was elected a member of the board of directors to fill the vacancy caused by the death of Mr. Curtin.

Improve Gas Service

Nearly six miles of new gas mains are now being constructed by the Central Maine Power Co. in the Augusta and Waterville gas districts which will not only improve service in these communities but will open up territory not previously reached.

New Hampshire Towns To Be Served With Butane Gas

The Coos Gas Company was recently authorized by the N. H. Public Service Commission to construct a butane gas plant to serve the city of Berlin and town of Gorham, N. H.

(News continued on page 72)

BUILD » » » » » »

DOMESTIC LOAD WITH SC HOUSE HEATING EQUIPMENT

COLUMBUS FURNACE

Appliances are improving! Habits of living are changing! As a result—domestic consumption is decreasing. The Gas Industry has turned to House Heating to overcome this trend.

Aggressive selling of House Heating equipment will not only offset this decrease but will build good will, increase domestic revenue, and yield rich merchandise profits.

JANITROL

Surface Combustion

SURFACE COMBUSTION CORPORATION
TOLEDO, OHIO.

SALES AND ENGINEERING SERVICE
IN PRINCIPAL CITIES

Lighting of Statue of Liberty Made Possible by Henry L. Doherty

A long buried human interest story concerning the Statue of Liberty, Henry L. Doherty and The World, has been brought to light for the first time in the July 18th issue of Cleveland Town Tidings, a weekly society paper published in Cleveland.

The Statue of Liberty, America's Centennial present from France, was unveiled in October, 1886. Thirty years later the New York World started a subscription list to build a flood lighting system to make Liberty stand out from the nighttime darkness of the harbor. The World headed the list with a subscription of $1,000 and some 80,000 persons contributed to the illumination fund.

Before starting the subscription list The World called on Mr. Doherty to underwrite the fund. Mr. Doherty agreed to bear any deficit which might result when the books were finally balanced. His only stipulation was that neither his name nor that of George Williams, his associate, who conceived the idea and proposed it to The World, should be used in connection with the matter

The deficit, which was wiped out by Mr. Doherty's check, ran into thousands of dollars. That was fifteen years ago, and even Mr. Doherty's closest associates knew nothing of his public spirited deed until the story appeared last week in Cleveland Tidings.

Authorized to Build Gas Plant

The Central Hudson Gas & Electric Corporation has been authorized to build a gas plant and to exercise franchises for the furnishing of gas in the villages of Nelsonville and Cold Spring and the town of Phillipstown, New York. There is a proposal before the Commission to merge the Phillipstown Electric Corporation with the Central Hudson Corporation and if this proposal is approved, both gas and electricity will be furnished throughout the territory by the Central Hudson Company. The company proposes to install a butane air gas plant in Cold Spring at a cost of $23,000 and to extend transmission lines from this plant to Nelsonville and town of Phillipstown at an estimated cost of $36,266.

Natural Gas to Heat Hotel

Natural gas will be used for heating the renovated Hotel Dempsey, at Macon, Ga., according to a statement made by Charles Leach, manager of the Macon Gas Company. The hotel is to be equipped with two 150-horsepower boilers, which, heated with natural gas, will provide steam and hot water for the hotel and its new annex. This is the second hotel in the South to be equipped with natural gas for heating, the first having been the Peabody Hotel, in Memphis, Tenn.

Molasses Pipe Line In South

Water, oil, gas, gasoline—and now comes word that even molasses is being conveyed by pipe line down in New Orleans, the molasses-refining center of the nation. This is not a "Believe It Or Not" item, but an actual fact—real molasses, transported through a real pipe line with regular Dresser Couplings. Pipe-line transportation affords unlimited possibilities, and, although not officially, it is reported that a survey is being made to determine the feasibility of shipping pulverized coal, flour, and even various kinds of grain by this method.

Work Progressing on Gas Lines

The North Central Gas Company, which will get its natural gas from the Muskrat and Sand Draw fields of Wyoming, has completed its distribution system into Fort Laramie, Guernsey, Douglas, Lingle and Torrington, Wyoming, and is rushing its connection to Wheatland, 18 miles. The booster station near Caspar is almost completed.

Plan Natural Gas Extension

Plans for a $43,000 natural gas extension from Walnut Creek to serve the towns of Danville, Alamo, and Diablo, have been announced by Coast Counties Gas and Electric Company, San Francisco, Cal.

Brings In Good Gas Well

Postlewaite well No. 1, first of the O'Neil group of well in the Cut Bank area of Montana for the supplying of natural gas to Butte, Helena, Anaconda and other Montana cities, was brought in recently, making 20 million cubic feet daily. This is a project of the Montana Power Company.

Declare Dividends

The board of directors of the Northern Indiana Public Service Company has declared the following quarterly dividends on the preferred stock: One and three-quarters per cent on each share of outstanding seven per cent preferred stock; one and one-half per cent on each share of outstanding six per cent preferred stock, and one and three-eighths per cent on each share of outstanding five and one-half per cent preferred stock.

Boston Consolidated to Construct Large Service Station

Centralizing its customers' service and engineering work to gain further efficiency and faster service, the Boston Consolidated Gas Company will soon begin construction of a large service station and garage at McBride Street, Jamaica Plain.

With the completion of the new building in December virtually all of the company's service activities can be brought together at a more central location in the company's territory, accomplishing shorter trips and speedier service in answer to customers' calls for installation and service work.

The centralized organization in the new structure will include, beside the garage, the customers' service, distribution, construction, and engineering departments, as well as the meter shop, an appliance school, and modern testing laboratories for testing all appliances. Large space for storage has also been provided.

The new service station, of reinforced concrete construction, will have five floors and a total floor space of 120,000 square feet. The adjoining garage, a two-story steel frame structure, is to have 32,000 square feet of floor space. Both buildings will be heated by gas.

Lunches will be prepared for employees by a large cafeteria, operated by a committee of employees. According to present plans, the latest gas appliances, rent for the cafeteria, and gas used in cooking will be donated by the company.

More than a score of shower baths are to be installed for the use of employees, and two distinct locker rooms with showers between will enable men employees to change from working clothes in one room, bathe, and then don street clothes in the other room. Mechanical ventilation will be a feature of the meter shop and the testing rooms in the main building, while the latter will also have air conditioning.

Excellent freight facilities are provided by the right of way of the New York, New Haven & Hartford Railroad, adjacent to the service building.

Net Earnings of Standard Gas & Electric Show Decrease

Combined net earnings of all subsidiary and affiliated public utility companies of Standard Gas and Electric Company for the twelve months ended May 31, 1931, showed a decrease of 2.39 per cent, as compared with the previous twelve months, according to John J. O'Brien, president of the company. Gross earnings decreased 2.71 per cent.

A TEAM OF TIME-SAVERS

Assuring the Completion of the Most Trench . . . . in the Most Places . . . . at the Least Cost

THE CLEVELAND BABY DIGGER

AND

THE CLEVELAND TAMPER-BACKFILLER

For all 'round practical usability in delivering complete trench jobs, (that is, jobs where trench is dug, backfilled and thoroughly tamped) you can't beat the combination of the Cleveland Baby Digger and the Cleveland Tamper-Backfiller.

With these two compact, sturdy machines, the front and rear of your trench jobs can now be kept close together; for while excavating and pipe-laying progress, the Tamper-Backfiller is replacing the soil right on their heels, leaving no trench open overnight.

Visualize what this combination means on gas distribution and plant work. Think how it saves time—how it reduces to a minimum public liability—how it cuts labor costs to bed-rock, and how much new efficiency and economy it brings to the trench job.

More than eleven years of continuous service have proved indisputably that the Baby Digger's design is correct. It incorporates in one efficient unit the five essentials necessary for satisfactory, economical trench digging—compactness, mobility, power, speed and ruggedness.

Less than 5 feet in over-all width it replaces hand labor in the most congested districts. Without excess tonnage (approximate weight 4 tons) it has unrivalled transportability.

These same features are to be found in the Tamper-Backfiller. With this one compact unit, one-man operated, you can tamp and backfill cheaper and more thoroughly than you have ever done before. These operations can be conducted simultaneously if desired.

Put these two intensely practical machines to work and watch how they increase the production of your gangs, at the same time creating amazing reductions in your total cost per foot. Write today for full information.

THE CLEVELAND TRENCHER COMPANY

"Pioneers of the Small Trencher"

20100 St. Clair Ave. **Cleveland, Ohio**

Personals

W. F. Raber was elected president of San Diego Consolidated Gas and Electric Company at a recent meeting of the board of directors, it has been announced by John J. O'Brien, president, Standard Gas and Electric Company. Mr. Raber has been vice president and general manager of San Diego Consolidated Gas and Electric Company since 1924.

Mr. Raber began his career with the Central Union Telephone Company of Ohio in 1891. In 1892 he became superintendent of the lighting department of the Citizens Electric, Railway, Light and Power Company in Mansfield, Ohio, and in 1903 was made general manager of the Mansfield Railway, Light and Power Company in Mansfield. He left this position in 1905 to become general manager of the Enid Electric Light and Power Company in Enid, Oklahoma. From 1906 to 1911 he was general manager of the Ottumwa Railway Light and Power Company in Ottumwa, Iowa. In 1911 he became vice president and general manager of the Arkansas Valley Railway, Light and Power Company, now the Southern Colorado Power Company, in Pueblo, Colorado, which position he held until 1924 when he was elected vice president and general manager of the San Diego Consolidated Gas and Electric Company.

M. J. O'Callahan has been appointed Assistant to the General Sales Manager of the Consolidated Gas Company of New York, according to an announcement made by N. T. Sellman, Director of Sales and Utilization. For the past four years Mr. O'Callahan has been Manager of the Domestic Division of the Sales Department.

H. N. Merritt, formerly Assistant Manager of the Domestic Division, of the Consolidated Gas Co. of New York, has been promoted to Manager, and N. H. Eaton, formerly Sales Manager of the 14th street District Office, has been made Assistant Manager.

A. S. Rinaldeaux, formerly Sales Manager of the Central Union Gas Company, Bronx, N. Y., is now Sales Manager of the 14th street District Office. J. A. DeRusha has succeeded him at the Central Union Gas Company. Mr. DeRusha was formerly Sales Manager of the Gas Company office at 125th Street.

Ray C. Finch, formerly Director of Domestic Sales for the Seattle Gas Company, was recently appointed Commercial Manager of all properties of the Northwest Cities Gas Company with headquarters in Walla Walla, Wash.

Through long and profitable connections with the sales of Electrolux Refrigerators, both with the Seattle Gas Company and as head of the apartment house division of the Portland Gas & Coke Company, Mr. Finch is considered one of the leading authorities on Gas Refrigeration in the Northwest. He brings to his new post a splendid record which forecasts every success for his company and himself personally.

O. H. Simonds, for the past eight years associated with Electric Bond and Share Company as operating sponsor of certain of their gas and electric properties in the Mississippi Valley, including United Gas Corporation, has been elected president of Appalachian Gas

O. H. Simonds

Corporation, succeeding H. G. Scott, who remains as a director.

Mr. Simonds was born in Duluth, Minn., and was graduated from Cornell University with the degree M. E. Until 1915 he was with General Electric Company in Schenectady, N. Y., and Chicago, Ill. He then became general manager of the Vicksburg, Miss., Light and Traction Company, and later vice president and general manager of Dubuque, Iowa, Electric Company.

He has specialized in the operations of gas and electric properties for over 15 years, and is director of a number of utilities. He has been on the board of Memphis Natural Gas Company since its organization, and is also director of Louisiana and Arkansas Railroad.

During his association with Electric Bond and Share Company, in addition to United Gas Corporation he sponsored the operations of such utilities as Louisiana Power and Light Company and Mississippi Power and Light Company. When in Iowa Mr. Simonds was active in the affairs of the National Electric Light Association, and was first president of the Middle West Division of the Association.

William E. Barrett announces that he has returned to public utility consulting practice with an office at 110 East 42nd Street, New York. Mr. Barrett is well known through the gas industry, having been associated with it for a number of years.

Frank R. Phillips was elected president of the Philadelphia Company at a meeting of the stockholders of the company held in Pittsburgh recently, it has been announced by John J. O'Brien, president of the Standard Gas and Electric Company. Mr. O'Brien has been president of the Philadelphia Company since May, 1929. At that time Mr. Phillips was elected senior vice president of the company and his election as president comes as the result of the many years during which he has been associated with the Philadelphia Company and its subsidiaries, according to Mr. O'Brien.

The Philadelphia Company and its subsidiary and affiliated companies is a subsidiary of Standard Gas and Electric Company.

Mr. Phillips has been connected with utilities in Pittsburgh for the past 21 years and is a nationally known figure in the public utility industry. He went to Pittsburgh in 1909 to assist in the development of the street railways of that city. In 1910 he was made superintendent of equipment of the Pittsburgh Railways Company which position he held until July, 1923, when he was made acting general manager for the receivers. Upon the lifting of the receivership in February, 1924, he was appointed mechanical and electrical engineer and also representative of the company to the Traction Conference Board. On September 1, 1926, he was elected vice president and general manager of the Duquesne Light Company and its subsidiaries and in April, 1928, was elected vice president of the Equitable Gas Company and its subsidiaries. On May 24, 1929, he became senior vice president of the Philadelphia Company and president of its affiliated corporations.

O. A. Jennings was recently elected vice president and commercial manager of the Oklahoma Gas & Electric Co. Mr. Jennings has been commercial manager of the Oklahoma Gas and Electric Company since 1919. For 14 years prior to that time he was located in Dallas, Texas, as a special representative of the General Electric Company.

Mr. Jennings is well known in the public utility business and has made notable contributions to the electrical industry as a result of his success in developing the application of electricity to the production of oil, particularly in Oklahoma's oil fields.

R. C. Hoffman, Jr., vice president of the Southern Cities Public Service Corporation, with headquarters in Atlanta, has been promoted to the executive staff of the Central Public Service Corporation, with headquarters in Chicago. He will, however, retain an office in Atlanta, and will keep in close touch with affairs in the South.

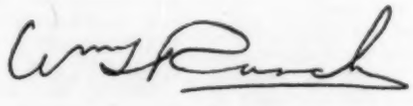
C. M. Carter, formerly district engineer of the Wichita Gas Co., was transferred to Hutchinson, Kansas, as engineer and superintendent of the Hutchinson Gas Company.

(Personals continued on page 76)

AN OPEN LETTER TO THE GAS INDUSTRY

The announcement of July 22nd, 1931, that the American Gas Products Corporation had become a division of American Radiator Company, will not change the sales policy or sales personnel of the Company.

As a division of American Radiator Company, we will have greater resources for development, research and manufacture with which to better serve the interests of the gas industry.



President

AMERICAN GAS PRODUCTS CORPORATION

T. B. Wilson was recently elected president of Louisville Gas and Electric Company. Mr. Wilson has been vice president and general manager of Louisville Gas and Electric Company since 1924.

The board of directors also elected as officers of Louisville Gas and Electric Company, J. J. McKenna, vice president and treasurer; Robert Montgomery, vice president in charge of sales, and Frank J. Pfeiffer, secretary. Mr. McKenna was also elected a member of the board of directors.

Mr. Wilson is a native Kentuckian, having been born at Covington, Kentucky, on March 12, 1877, and was educated in the public schools of that city. His first connection with the electric industry was on June 10, 1896, when he was employed by the Citizens General Electric Company, one of the predecessors of the Louisville Gas and Electric Company. His first work was in that company's generating station at Tenth and Rowan Streets. In 1905 he was elected secretary and treasurer of the Louisville Lighting Company; and when this company, together with other electric utilities of Louisville, was merged into the Louisville Gas and Electric Company in 1913, he became treasurer and assistant secretary of the company. In 1915 he was appointed assistant general manager, in addition to his duties as secretary and treasurer of the company, which position he held until 1924, when he was elected vice president and general manager.

J. F. Owens was elected president of Oklahoma Gas and Electric Company at a meeting of the board of directors held in Oklahoma City recently. Mr. Owens had been vice president and general manager of Oklahoma Gas and Electric Company since 1918. The office of president has been held by Mr. John J. O'Brien who is president of Byllesby Engineering and Management Corporation and Standard Gas and Electric Company.

The board of directors also elected as officers of Oklahoma Gas and Electric Company, W. R. Emerson, vice president and treasurer; Frank J. Meyer, vice president in charge of operation; George Ade Davis, vice president in charge of public relations, and B. M. Lester, secretary of the company.

Mr. Owens entered the public utility business as manager of the Baldwin Gas Company, Baldwin, Kansas, in 1905, and managed the Wagoner Gas Company at Wagoner, Oklahoma, from 1906 to 1908, when he became connected with the Caney River Gas Company as general superintendent, remaining with that company until he joined the Byllesby organization in 1910 as superintendent of the gas department of the Muskogee Gas and Electric Company, which position he held until 1915. During the latter part of 1915 and 1916 he was superintendent of gas construction and installed gas distribution systems in the towns of Enid, El Reno and Yukon. From that time until his election as vice president and general manager of the Oklahoma Gas and Electric Company, he was manager of the Muskogee Gas and Electric Company at Muskogee, Oklahoma.

Frank A. Lane, superintendent and manager of the Citizens Gas Fuel Company, Adrian, Michigan, was made an honorary life member of the Michigan Gas Association at the convention of that organization at Mackinac Island, June 29 and 30, and July 1, in recognition of his completion of sixty-two years of continuous service in the gas industry.

Mr. Lane, still on the job at the age

Frank A. Lane

of seventy-seven years, was born in 1854 and entered the gas business as an office boy of the Omaha Gas Company, Omaha, Neb., in 1869.

He was with the Omaha Gas Company until 1875, when he became superintendent for Charles R. Fabin of the Toledo Gas Light and Coke Company, Toledo, Ohio. He remained with this company until 1899, when he became superintendent of the Peoria Gas Light and Coke Company of Peoria, Ill.

From 1901 to 1903, he was superintendent of the Paducah Gas Light and Coke Company of Paducah, Ky. From 1903 to 1908, he was construction superintendent for the Lloyd Construction Company, erecting gas equipment at various plants. He became superintendent and manager of the Citizens Gas Fuel Company at Adrian in 1908, which position he still holds.

During this period of twenty-three years he has been affiliated with the Michigan Gas Association, which has now made him an honorary life member.

J. Y. Wheeler, formerly division manager of the Community Natural Gas Company at Wynnewood, Oklahoma, has been appointed superintendent of distribution in Oklahoma. He will maintain his headquarters in Wynnewood.

D. J. Niemeier, manager of the Shelbyville District of the Kentucky Utilities Co. has been appointed district manager at Lebanon. Mr. William Hanna succeeds Mr. Niemeier at Shelbyville.

W. H. Farley is now local manager of the Community Natural Gas Co. at Temple, Texas.

James C. Sackman has been promoted to Merchandise Sales Supervisor of the Gary, Ind., Heat, Light and Water Company.

Henry J. Gille, formerly general sales manager of the Puget Sound Power & Light Company, has been appointed manager of agricultural-industrial development.

R. R. Bollinger, formerly auditor for the Jersey Central Power & Light Co. has been appointed General Auditor of the Company.

Noel de Cordova has been appointed gas house heating supervisor of the Central Hudson Gas & Electric Company, Poughkeepsie, N. Y.

Marcy L. Sperry succeeds Mr. Claude C. Curtis as Vice President and Manager of the Fall River Gas Works Company, Fall River, Mass. Mr. Curtis was transferred to the Puget Sound Power and Light Company at Seattle, Washington.

Walter J. White was recently appointed sales manager of the Milford, Mass. Gas Light Company. He was formerly with the Webster & Southbridge Gas & Electric Co.

Robert Naylor has been put in charge of the natural gas sales promotion department of the Northwest States Utilities Co., Great Falls, Montana. Mr. Naylor was formerly sales manager of the Montana-Dakota Utilities Company, at Rapid City, S. D.

James W. Mackie was appointed auditor of Luzerne County Gas & Electric Corporation, with headquarters at Kingston, Pa. Mr. Mackie was formerly chief clerk.

R. W. Petter, formerly superintendent of the Bismarck Division of the Montana-Dakota Power Co. is now manager and superintendent of the Dickinson, North Dakota District.

H. J. Morgan has been promoted to District Merchandise Manager of the Beaver Dam district of the Wisconsin Power & Light Company.

James H. Erwin, for five years a construction engineer for the Central Public Service system, has been appointed superintendent of the gas plant at Rockford, Illinois, to succeed Ray H. Arndt, resigned. Mr. Erwin is a graduate of Purdue University and for some years was an engineer with the Indiana board of public utilities. He was in charge of the construction of an extensive coke plant at Fort Wayne, Indiana, and also one at Rockford.

ANNOUNCING

The New

The Humphrey Gas UNIT HEATER

No 60

Now there is a Humphrey Gas Unit Heater of proper capacity for every purpose in the commercial and industrial field.

The No. 60 Humphrey Gas Unit Heater is the latest development of the General Gas Light Co., and a smaller companion to the No. 100, and No. 200 Humphrey Gas Unit Heaters.

The No. 60 Humphrey Gas Unit Heater is designed especially for heating small stores (candy, cigar, grocery), offices, shops, service stations, and similar places. It can be installed by wall-bracket or ceiling suspension method. The wall bracket as shown in above illustration is extra equipment and can be furnished for the No. 60 Humphrey Gas Unit Heater only.

CAPACITY

The No. 60 Unit Heater has an input rating of 60,000 B. T. U. per hour. It can be equipped to burn either manufactured or natural gas. It is equipped with a 12½ inch 6 blade 1⅜ inch pitch fan which is propelled by a 1/30 H. P., 1150 R. P. M. motor. The Unit delivers 690 cu. ft. of air per minute with a 40 degree temperature rise over room temperature. The air velocity is 495 ft. per minute. When vented, the Unit operates 83% efficient and is equivalent to 207 sq. ft. steam radiation or 450 sq. in. of warm air furnace leader pipe area.

The over all dimensions are 26¾ in. high, 22⅜ in. wide and 23 in. deep. It is finished in green and black Japan with a chromium trim. Its shipping weight is 210 lbs., net weight 150 lbs.

Write today for the new 40-page Humphrey Gas Unit Heater Catalog and Hand Book, just off the press.

General Gas Light Company
Kalamazoo, Michigan

44 West Broadway
New York City, N. Y.

135 Bluxome Street
San Francisco, Calif.

Obituary

JAMES E. STACEY

James E. Stacey, aged 74, of Wyoming, Cincinnati suburb, and former head of the Stacey Engineering Co., which combined with the International Derrick & Equipment Co. of Columbus to form The International-Stacey Corp., died of a heart attack recently at his home. Mr. Stacey had been active in the manufacturing and public utilities field more than 50 years, after entering the Stacey Manufacturing Co., which was founded by his father.

O. P. SIMLER

O. P. Simler, Vice President and General Manager of the Hoffman Heater Company, Louisville, Ky., died recently at the age of 49 years.

Mr. Simler was born in Philipsburg, Pa. He was connected with the water heater industry for the past twenty-five years and with the Hoffman Heater Company for twelve years. He is survived by his wife, Mrs. Celia Baker Simler and two sons, David and Richard Simler.

EDWARD DOMINICK McDONALD

The host of friends of Edward Dominick McDonald will regret to learn of his recent death. Mr. McDonald had been in the employ of the Pittsburgh Equitable Meter Company since 1917, working from the Chicago office. For the past several years he was Manager of Gas Meter and Regulator business in that territory.

Prior to his connection with this company, he had been with the Peoples Gas Light and Coke Company of Chicago since 1902. Starting as a meter repair man, Mr. McDonald worked in various departments gaining valuable experience and a thorough knowledge of many phases of the public utility field.

Mr. McDonald is survived by his widow, Mrs. Marguerite McDonald, and his son, Edward.

WILLIAM ANDERSON

William Anderson of Lynn, Mass., died at Mt. Vernon, N. H., July 3, 1931.

Mr. Anderson was very well known to the older members of the New England Gas Engineers as he had spent over sixty years in the business as Superintendent of the Works at Chelsea, Mass., East Boston, Mass., and last with the Lynn Gas and Electric Company under Mr. Prichard.

He was 84 years of age, was a member of the Masonic Fraternity, G. A. R. and Guild of Gas Managers.

The passing of Mr. Anderson removes another of the old gas engineers of New England.

TRADE NEWS

United Engineers & Constructors, Inc. Activities

Michigan Gas and Electric Company, Marquette, Michigan, has awarded contract to furnish, deliver and install necessary foundations for bench of 6's type "S" U. G. I. Vertical Chamber Ovens and auxiliary equipment.

Public Service Electric & Gas Company, Trenton, N. J., has awarded contract to furnish a grit separator for No. 3 set, waste heat boiler stack.

Michigan Federated Utilities, Mt. Clemens Mich. has awarded contract to furnish, deliver and install 109,000 feet of 4" welded steel main between St. Johns and Owosso, Michigan, and to furnish, deliver and install 25,000 feet of 2" welded steel main and services in Ovid, Mich.

Manchester Gas Company, Manchester, N. H. has awarded contract to furnish, deliver and install 1000 feet of 12" steel welded main and 300 feet of 8" steel welded main for bridge crossings over Merrimac and Piscataquoc Rivers.

Acquires Capital Stock of American Gas Products Corporation

American Radiator & Standard Sanitary Corporation, through its radiator and boiler subsidiary, American Radiator Company has acquired all the capital stock of American Gas Products Corporation.

American Gas Products Corporation, as a division of American Radiator Company, will retain its present general offices in the Chrysler Building, New York City. The officers and executives are:

President William T. Rasch; Vice-President of Manufacture and Development, Edward R. Downe; Vice-President of Sales, H. Leigh Whitelaw; Secretary and Treasurer, Frank J. Mullany; General Manager of Sales, Harvey H. Dugdale; Director of Research, Carl H. Flink.

The acquisition of American Gas Products Corporation represents a further step in Radiator's progress involving the manufacture and sale of a complete line of gas-fired equipment for public utilities and also for the heating and plumbing trade. American Radiator already manufacture gas boilers and gas radiators. A line of gas ranges and new hot water heaters will soon be in production.

The sales policy of American Gas Products Corporation will remain unchanged.

Link-Belt Pacific Division Elects Ralph Hoffman Vice President

Ralph M. Hoffman, for 8 years manager of the Seattle office of the Pacific Division of Link-Belt Company, has been appointed Vice-President and Sales Manager of that division, with headquarters at San Francisco. He succeeds Mr. Harold H. Clark, who retired on June first.

Twenty years of experience on the Pacific coast in selling elevating, conveying and power transmitting equipment well fits him fo rhis new position. His activities in trade affairs has kept him posted on the needs of the various industries.

The new vice-president will take up his duties in the recently completed half-million dollar plant of the company, located at 400 Paul Avenue, San Francisco, California.

International-Stacey Corporation Closes Its San Francisco Office

E. A. McCallum who has been in charge of the San Francisco offices of the Stacey Engineering Company has been transferred to the Pacific Coast headquarters of the International-Stacey Corporation now located at 410 Subway Terminal Building, Los Angeles. All Pacific Coast business dealing with the R-C-W Blower Division, Stacey Gas Construction Division and the Ideco Oil Well Equipment will be handled from the Los Angeles office.

E. W. Stiner Now Associated with A. C. Nielson Co.

Ernest West Stiner, formerly Western Field Counsellor for Bigelow, Kent, Willard & Company, has joined the exclusive staff of A. C. Nielsen Company, merchandising engineers, Chicago, as Vice President and Western Manager.

For the past 13 years Mr. Stiner has been associated in various capacities with the professional field, devoting the major portion of his time to solving problems of general management and distribution. His work has included the analysis and practical application of organization management, merchandising in all its phases, and general production problems.

New Catalog on Shallcross Controls

Shallcross Control Systems Co., Milwaukee, have just brought out a new loose leaf catalog describing control equipment of interest to the gas industry. The catalog is kept up to date by the publishing of new sheets and revising old ones.

(Trade News continued on page 80)

Kumfort No. 52

HAS A HEATING CAPACITY OF MORE THAN 95 GALLONS PER HOUR!

This new, large-size KUMFORT is a *real* heater . . . built to take excellent care of the larger requirements on a really economical basis.

Like the other KUMFORT heaters, its greatest feature is—DEPENDABILITY, for such quality and performance are unusual in an automatic gas water heater that sells at a low price.

And like the other Kumforts, the No. 52 can now be furnished, if desired, with the tank of EVERDUR-COPPER, the new metal that combines the strength of steel with the noncorrosive properties of copper.

You've every reason to write in for specifications and prices.

THE LOVEKIN WATER HEATER COMPANY

NEW YORK PHILADELPHIA CHICAGO

Appoint Distributor

The Fusion Welding Corporation, Chicago, Illinois, has appointed the Puritan Compressed Gas Corporation of Kansas City, Missouri, as distributors for the Weldite line of welding rods. The territory served by the Puritan Compressed Gas Corporation will include the State of Kansas and the Western portion of Missouri.

Until recently this company has operated as the Kansas City Oxygen Gas Company, one of the oldest companies in the welding supply business in that section of the country. The address of the Puritan Compressed Gas Corporation is 2012 Grand Avenue, Kansas City, Missouri.

Reynolds Gas Regulator Co. Appoint Southwestern Representatives

The Reynolds Gas Regulator Company, Anderson, Ind. recently announced the appointment of Seidenglanz & Company, 2nd Unit—Santa Fe Bldg., Dallas, Texas, as their Southwestern representatives. This territory includes New Mexico, part of Old Mexico, Oklahoma, Arkansas, Louisiana and Texas.

Johnson Gas Appliances Co. Appoint New England Representative

A connection has just been completed whereby R. M. Henshaw & Company, 250 Stuart Street, Boston, Massachusetts, will represent the Johnson Gas Appliance Company throughout the New England States. Mr. Henshaw formerly represented the Johnson Gas Appliance Company through his connection with the Eastern Service Company of Boston.

New Webster Manual and Data Book

The Webster Engineering Company, Tulsa, Oklahoma, has just completed the publication of the Webster Manual and Data Book, after two years of compilation. It is a collection of information on industrial gas-fired burner design and application, and contains 120 pages. Copies may be obtained by writing the Webster Engineering Company. A ready reference manual of information on gas-fired heating and power boiler application.

Bulletins on Alco Products

Alco Products, Incorporated, 220 East 42nd St., New York City, Division of American Locomotive Company recently published three bulletins. Bulletin 1009 covers Alco products and services and contains photographs of equipment. Bulletin 1010 is a 4 page illustrated bulletin covering Alco Steel Pipe. Bulletin 1011 describes Alco steel plate work.

E. L. Mills Becomes Vice-President of The Bastian-Blessing Co.

Ellsworth L. Mills, formerly Sales Manager for The Bastian-Blessing Company, has been elected Vice-President of the Company. Mr. Mills continues in charge of sales.

E. L. Mills

As president of the Gas Products Association, Mr. Mills has done considerable to promote better marketing methods among all competitive companies. Mr. Mills' experience in welding dates back to days, when as a young engineer, graduate of Cooper Union Institute, he foresaw the possibilities in the development of the welding field, and he has devoted himself to this since that time.

Move New York Office

The Cement Gun Construction Company, Chicago, Ill., have recently announced the removal of their New York offices to the Woolworth Building.

New Bulletin Issued by Brooke Engineering Co.

Brooke Engineering Company, Inc., 3640 N. Lawrence St., Philadelphia, Pa., have just issued bulletin H-2 which contains charts illustrating the operation of Brooke Regulators on various installations. The charts are taken from actual daily operation; each set in a different plant.

The Brooke regulators are electrically actuated, with no pilot valves, stuffing boxes, or packing.

Booklet will be sent upon request.

Bulletin for Compressor Users

An 8-page Bulletin, with points arranged for easy reference, is being mailed by The Cooper-Bessemer Corporation to those interested in compact four-cycle gas-engine-driven compressor units of 400 brake horsepower.

Installation photographs of the new Type-40 units in Mid-Continent, Pacific Coast, and Eastern compressor stations are shown. There is a short discussion of items such as compactness, improved design, accessibility, long life, economy, and load-carrying ability. Under the heading of "general specifications," twenty-one points are listed and described. There is a drawing of the space plan for a five-unit compressor station; also a top view of a twin unit, and a side-elevation view.

Requests for the Type-40 Bulletin are being handled from the Mt Vernon, Ohio, office and from district offices.

Natural Gas Equipment, Inc., has announced the appointment of James C. McCluskey as sales manager, southern division, with headquarters at Los Angeles. Mr. McCluskey has been associated with Natural Gas Equipment, Inc., for the past eight years in the California and mid-continent fields. In his new capacity he will have charge of sales in Southern California, including the Kettleman Hills area.

R-C-W Blowers for South Africa

A shipment of large R-C-W Heavy Duty Rotary Positive Blowers was recently made from the Connersville plant of the International-Stacey Corporation to South Africa.

These blowers are standard No. 6½ R-C-W H. D. Blowers. Each has a capacity of 12,500 cubic feet of air per minute at two pounds pressure. These machines are duplicates of eight similar R-C-W machines previously installed by the Mutulira Copper Mines, Ltd. for their flotation mills in South Africa.

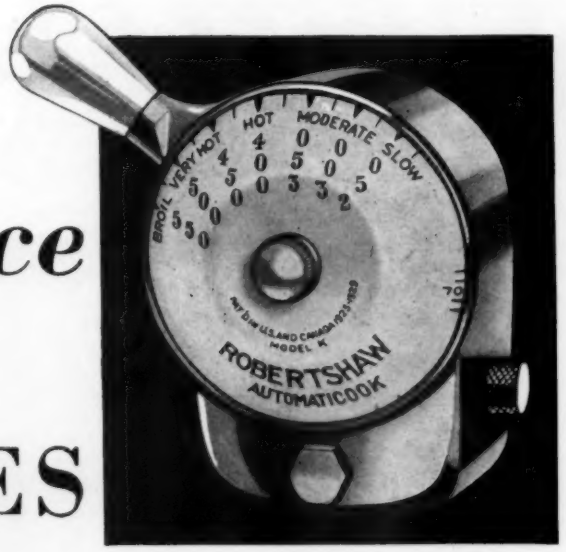
In addition to the above shipment, three smaller units were also sent to South Africa, and a number of others to England, South America, India and Canada during the same week.

Precision Thermometer and Instrument Co. issue new Bulletin

Bulletin "C" has just been issued by the Precision Thermometer and Instrument Company, Philadelphia, Pa., describing their complete line of thermometers, such as laboratory thermometers, test thermometers, calorimeters and differential thermometers, specification thermometers, etc., also "Princo" Specialties. The bulletin is attractively illustrated and contains specifications and prices.

(Trade News continued on page 82)

The Price of Performance helps sell MORE RANGES



"The Unseen Chef who makes every meal a success"

WHEN gas range manufacturers equip their ranges with the Robertshaw they *know* what they are doing.

They know they are using the finest automatic oven control that can be made. And they are glad to use it despite its higher cost, for the very good reason that they also know that it gives the best service.

Performance counts in gas range merchandising just as decidedly as in all the other improved devices now used so generally in the American home.

National advertising has made the better performance of Robertshaw equipped ranges known to all the housewives of the land. They expect to obtain the Robertshaw when they buy a gas range—in fact, many new ranges are being sold right now simply because so many women want the freedom from oven watching that they know a Robertshaw equipped range will bring them.

That's why you can increase your range sales this season by "playing up" your Robertshaw fitted ranges. Write today for the complete Robertshaw program of magazine and radio advertising. It's a selling force that you can cash in on immediately.

ROBERTSHAW THERMOSTAT COMPANY
YOUNGWOOD · PENNSYLVANIA

ROBERTSHAW
AutomatiCook

Doublex Simplex Pipe Catalog Now Ready

A catalog on Doublex Simplex pipe has just come from the press, and is now ready for distribution to all users of pipe and fittings. It contains 48 pages of useful information and is profusely illustrated. Being letter size it may be readily filed for future reference.

This catalog describes in detail Mono-Cast Doublex Simplex cast iron pipe—a product which is being widely used for the distribution of water and gas. The manufacturers recommend it for both high and low pressures.

Doublex Simplex pipe is the outgrowth of two major developments—pipe made centrifugally in refactory molds, and the development of a satisfactory joint embodying the stuffing box gland principle.

Specifications governing the manufacture of this product are included in the current edition of the Doublex Simplex catalog. Copies can be obtained on request to the American Cast Iron & Pipe Co., Birmingham, Ala.

New Sprague Meter Catalog

The Sprague Meter Company, Bridgeport, Conn. have just issued Catalog No. 16 describing and illustrating their complete line of Sprague-Standard Dreadnaught and Special Cast Iron Gas Meters for manufactured, natural, butane-air and propane gases. The catalog also contains price lists of repair parts for various types of meters.

Copy of this catalog may be obtained upon request.

Booklet on Porcelain Enamel

The Porcelain Enamel Institute, Inc., 612 North Michigan Ave., Chicago, Ill., has just published a valuable booklet, "What You Should Know About Porcelain Enamel." It is addressed primarily to salesmen and advertising men interested in porcelain enamel as a finish for such products as washing machines, refrigerators, stoves and ranges, kitchenware, sign reflectors, tile, scales, etc.; however, the booklet contains other information of general interest, such as the use of porcelain enamel for artistic purposes in antiquity, the sources of the materials from which it is manufactured, and how it is fused into an iron or steel base. The booklet will be sent free upon request to the Porcelain Enamel Institute.

Combustion Steam Generator

Combustion Engineering Corporation, 200 Madison Avenue, New York, has just issued catalog SG-1, describing the Combustion Steam Generator, which is a single unit embodying in an integral design the several elements required in the production of steam. The purpose of this design is to so coordinate the functions of the various elements as to insure maximum efficiency with minimum operating and maintenance costs.

The Combustion Steam Generator is available in 8 standard sizes providing a wide range of capacities for any desired steam pressure and temperature. Pulverized fuel is introduced at the four corners of a completely water-cooled furnace and is burned with intense turbulent mixing action. The gases leaving the furnace pass through the superheater at the top of the furnace, thence through a bank of convection tubes and finally through a plate-type air preheater, to the chimney. A novel arrangement provides for regulating the temperature of the superheated steam under all conditions of operation.

The catalog is well illustrated and includes overall dimensions of the 8 sizes of steam generators. 20 pages and cover —8½ by 11.

New Bulletin Describing Dead Weight Type Pressure Gage

A pressure gage which embodies dead weight tester accuracy and permanence of calibration together with abundant power for the operation of remote type indicators, recorders and control devices is described in a new bulletin entitled, "Power Type Pressure Devices," which is being distributed by the Bailey Meter Company of Cleveland, Ohio.

The new bulletin No. 70 describes and illustrates Bailey Power Type Pressure devices explaining how the dead weight tester principle is combined with a Hydraulic Torque Amplifier and a Selsyn motor system of long distance transmission.

This power type unit in addition to serving as a pressure gage may be used for the operation of switches or for the direct positioning of small valves, rheostats or other equipment in accordance with pressure. Its principle use, however as explained in the bulletin is for the operation of a Master Steam Pressure Indicating and Recording system where it is desired to have a number of indicators or recorders located at various stations.

Bristol Issues Bulletin on Automatic Saturation Control System

Sales Bulletin No. 962 Supplement A describes Bristol's Recording and Controlling Equipment for Controlling Humidity in the Saturation of Natural Gas. Installation and operation of the control system is fully explained and illustrated. The bulletin also contains a chart showing controller settings for various distribution temperatures and is used for setting controller for obtaining a relative humidity of 95% or 100% in the distribution system. Specifications and price list are included.

Copies of this bulletin may be obtained by addressing the Bristol Company, Waterbury, Conn.

Broadside on New Brown Indicating Controller

The Brown Instrument Company, Philadelphia, has published a broadside describing and illustrating its new indicating control instrument for automatically controlling relatively high temperature processes and units such as heat treating furnaces, enameling furnaces, oil stills and towers, brick and pottery kilns, glass furnaces, galvanizing tanks, etc. A copy of this broadside will be sent to any industrial executive who will write for it.

New Compressor Bulletin

"4 Air Compressors Went to School" is the title of an attractive 16 page, 8½ x 11" bulletin just issued by Davey Compressor Company, Inc., Kent, Ohio.

The Davey Air Cooled Compressor, its easy starting, cool operation, portability, etc., is discussed and illustrated in this bulletin.

Copies of the bulletin will be forwarded upon request. Detailed technical data and service facts are likewise available from the Davey Compressor Co., Kent, Ohio, or their agents.

New Chaplin Fulton Literature

The Chaplin-Fulton Mfg. Company, Pittsburgh, Pa., have recently issued three new folders describing the Fulton Differential Relief Valves, Fulton Spring Type Regulators and The Fulton Back or Check Pressure Regulator. These folders are fully illustrated and give prices and directions for use.

Copies can be obtained on request.

New Ingersoll-Rand Bulletin

Ingersoll-Rand Company, 11 Broadway, New York, has issued Bulletin No. 3132, a 44-page booklet which illustrates and describes its line of turbo-blowers and turbo-compressors. The bulletin covers the construction and operation of single-stage and multi-stage blowers for discharge pressures of one to 40 pounds and capacities of 3,000 to 100,000 cubic feet per minute; and turbo-compressors for discharge pressures up to 110 pounds and capacities of 8,000 to 10,000 cubic feet per minute. The booklet contains 37 illustrations, including sectional drawings, charts, blower parts, and complete units.

H. R. Bowers Now with Meriam Co.

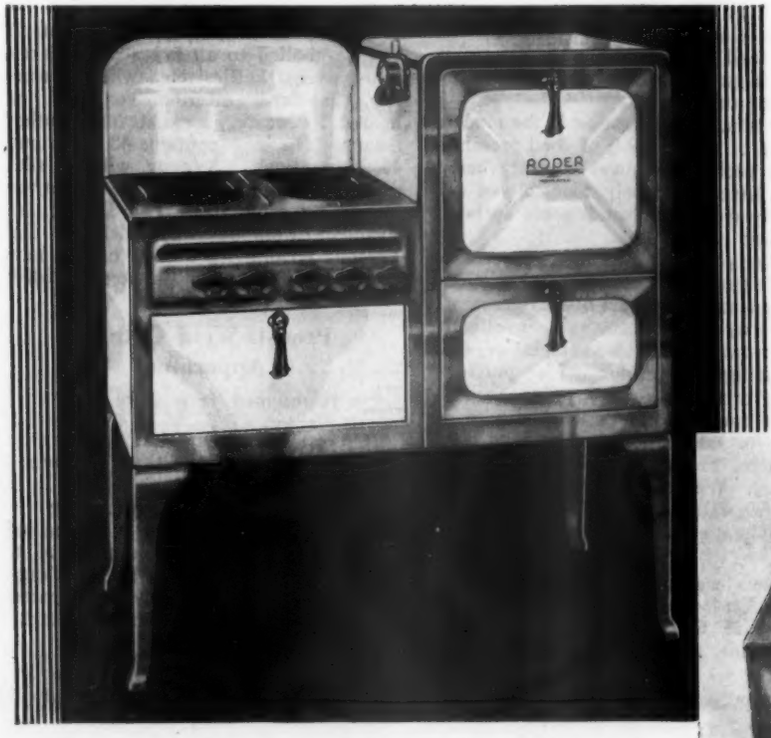
H. R. Bowers, formerly with The Bailey Meter Company, is now manager of sales and advertising for The Meriam Company, Cleveland, Ohio, manufacturers of Flow Meters.

(Trade News continued on page 84)

The ULTRA-CLASSIQUE Sani-Speed TOP

by ROPER

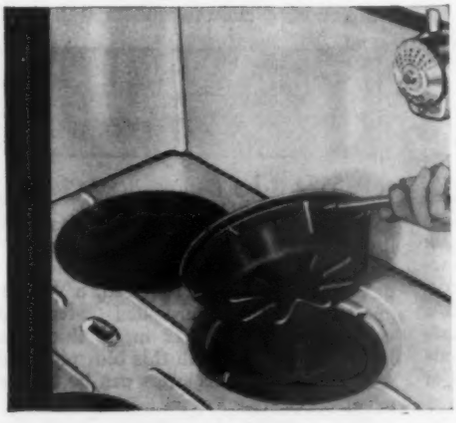
New — Beautiful and Easily Cleaned



Photograph at the right illustrates the construction of the new Sani-Speed Top which is Full Porcelain Enameled, sanitary, easily cleaned, and adds greatly to the beauty of the Roper Ultra-Classique.

A New Principle

Speedy Operation — Concentrated Heat



Now—a major improvement in gas ranges . . . the new Roper with *Sani-Speed* Porcelain Enameled Cooking Top. Four combustion-chamber-lids (easily removable for cleaning) set in the top over the four star burners directing the flame upward. Heat is concentrated on the cooking utensil above it—it is not spread out under the entire cooking top. The lids are perforated for speedy operation and beveled at the sides for visibility of the flame. (If desired, lids can be furnished without perforations.)

Sani-Speed Top Ranges may be had with all the famous Roper features, including the Insta-Flame, and Self-Slide Broiler. With these ranges on your display floor, you can meet and beat ALL competition.

Order Your Sample Sani-Speed Top Range Today—Act Now! ! !

GEO. D. ROPER CORPORATION, ROCKFORD, ILL.

Electrolux Activities

Every residence in the Southern California Gas Company's camps at Section Eight, Station Forty and Section Sixteen, as well as each cottage at Patrol Stations Five Six and Seven, is now equipped with automatic refrigeration. Twelve of the fifteen refrigerators at Section Eight and thirteen of the fifteen at Station Forty are Electrolux. All have expressed themselves as being well pleased with Gas Refrigeration.

An Electrolux is also installed in the Tehachapi cottage.

Electrolux Gas Refrigerators were practically unknown at Princeton, Ill. locally until this spring when Manager Leonard J. Saxum and Salesman Clyde M. Mast of the Princeton Gas Company decided something ought to be done about it. Starting off with a modest fifteen day campaign brought in eleven signed orders, sales since that time have shown surprising volume.

Among the refrigerators sold was a Chateau Model EA-10A to the Board of Supervisors of Bureau County for installation in the County Jail. Electrolux was chosen after the Board had carefully investigated eight competitive machines.

Princeton is a city with approximately only 1,000 gas consumers and 1,400 homes. Mr. Mast is the only sales representative of the company and this splendid record is a direct tribute to his keen ability.

According to an announcement by the Pacific Coast Gas Association, with headquarters at 447 Sutter Street, San Francisco, a cooperative campaign on gas refrigeration is now being featured in Sunset Magazine, popular west coast favorite. From one-third page to full page space is being reserved for this purpose in various numbers of the magazine.

In announcing the campaign, the official bulletin of the association makes the following statement: "Gas Refrigeration has the best load factor of any domestic appliance; it helps sell gas ranges, and the gas consumption is often enough to bring an unprofitable 'minimum' consumer up out of the red ink. There are now over 150,000 gas refrigerators in use, and about 4 percent of these are on the Pacific Coast."

Parker Inn, Albion, Mich., popularly termed as one of the finest apartment hotels in this section of the state, will shortly be completely equipped with Electrolux Gas Refrigerators. The first Electrolux was installed a year ago and other refrigerators have been gradually added since. Only three suites now remain without gas refrigeration.

The building is the best known place on Michigan Highway No. 12, and contains twelve housekeeping suites. Sale and installation was made by the Albion Gas Light Co.

The Lake Shore Gas Company, Ashtabula, Ohio, is justly proud of the record achieved by its stellar salesman George Jenks, during the six weeks Refrigeration Jubilee just concluded by the Gas Utilities Group of the Associated System.

Salesman Jenks walked off with individual laurels for all properties by selling 26 Electrolux refrigerators aggregating a total dollar volume exceeding $6,000.00. "Being thoroughly sold on our product is one reason why we think our sale went over successfully, together with good hard work and plenty of night calls," is Salesman Jenks' recipe for success.

Over sixty thousand customers of the New Haven Gas Light Company, have just received a personal invitation from Mr. H. R. Sterrett, Vice-President and General Manager, to call at the company's offices and inspect the new Electrolux gas refrigerator. Excerpts from the invitation are:

"Automatic refrigeration is the modern solution of the problem of food preservation, a problem common in every home. If you have not already done so, you will probably expect to install some form of automatic refrigerator.

"Have you seen the new Electrolux gas refrigerator which embodies a sensational advance in the art of refrigeration? It will pay you to personally investigate the several distinct advantages of this outstanding refrigerator before purchasing any other make.

"This company has established a reputation for merchandising only approved appliances, of unquestionable merit and efficiency. We recommend the Electrolux gas refrigerator as in our judgment the best automatic refrigerator on the market today."

Coupons were attached to the letter, which afforded customers the opportunity to have the company representative make definite appointment for demonstration.

Gas Appliance sales of the Brooklyn Union Gas Company, during the week ended July 11th were the third highest reached this year. The week's sales totaled 633 units, which is nearly 57 per cent higher than the figure for the corresponding week last year.

The warm weather continued to stimulate Electrolux Refrigerator sales. Two hundred ninety-three Gas Refrigerators were sold, 221 at wholesale and 72 at retail. The wholesale figure was also the third highest for 1931.

Booklet on Boiler Water Conditioning

Boiler Water Conditioning is the title of the new 16-page treatise just published by the Elgin Softener Corp., Elgin, Ill. This book, printed in two colors, discusses the various problems in the conditioning or treatment of boiler water. The book is profusely illustrated by pictures showing various types of scale and sludge, corrosion and pitting, embrittlement with a large number of blue prints showing various methods of gravity and pressure feeds for chemical control, the application of sludge deconcentrators to typical types of boilers, the schematic arrangement of deconcentrator and heat exchanger and the zeolite-deconcentrator combination.

A copy of this book may be obtained by writing Elgin Softener Corp., Elgin, Illinois.

New Catalog on Instruments for Automatic Process Control

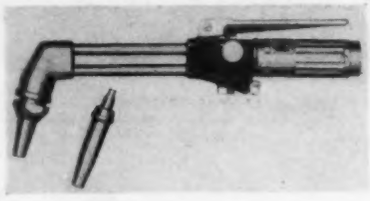
The Brown Instrument Company, Philadelphia, Pa., has just published a new catalog containing the latest data on Brown Automatic Controls for temperatures, pressures, flows, liquid levels, and other vital process operating factors. Tells how automatic controls help quality workers, management, cost and sales. Shows how temperature controls can be applied to all types of furnaces, kilns, ovens, kettles, etc., whether electric, gas-fired, oil-fired coal-fired or heated by waste gases, steam or other means. The book contains 48 pages and 46 illustrations. A copy will be sent promptly to any industrial executives requesting same from The Brown Instrument Company, Philadelphia, Pa. Persons writing for a copy of this new catalog should ask for Catalog No. 8008.

Prest-O-Weld Cutting Apparatus

(Continued from page 66)

cutting atachment without detaching the hose or hose connections and without the use of a wrench.

The locking device for connecting the detachable valve body to any one of these blowpipe handles consists of a locking bolt and wedge-shaped locking screw. The locking screw is operated by turning a ring and draws the detachable valve body and blowpipe handle together making a gas-tight joint.



Type C-105 Cutting Attachment

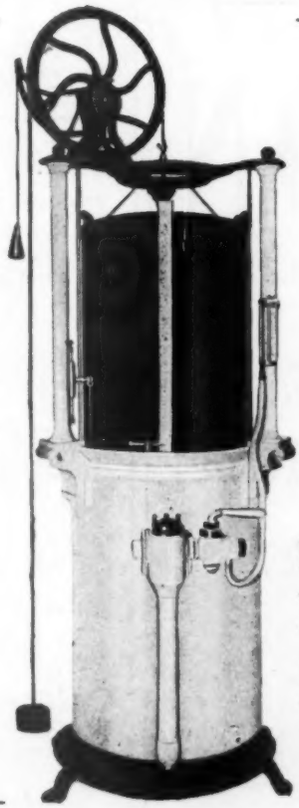
The blowpipe is light and well-balanced, but at the same time it is of sturdy construction to withstand the hard usage to which cutting blowpipes may be subjected. It is furnished as standard with four cutting nozzles and a 75-deg. angle head. If required, a 90-deg. angle head can be furnished. Steel and wrought iron up to 12 in. in thickness may be easily cut with this blowpipe and metal of greater thickness can be cut by experienced operators.

Type C-105 Cutting Blow Pipe

The Cutting Attachment is of the single joint design and attaches directly to the valve body. It is only 11 in. overall, and can be conveniently carried in the pocket of the operator when not in use.

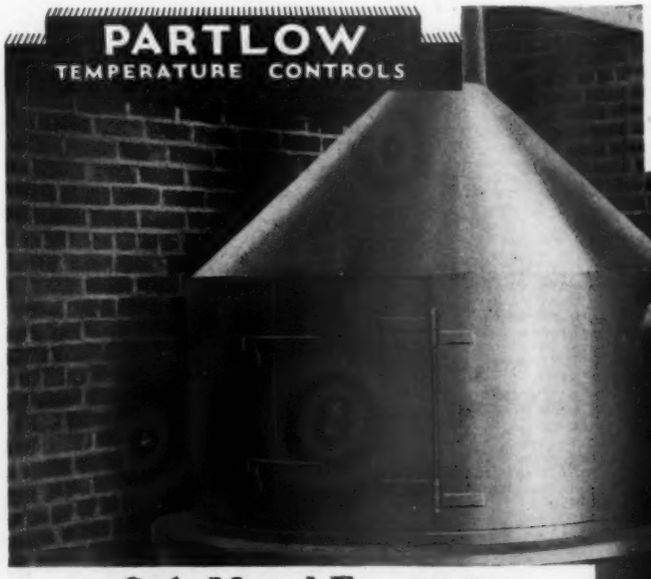
SUPERIOR

Gas Meters
Provers
Service Cleaners
Diaphragms
Repairs

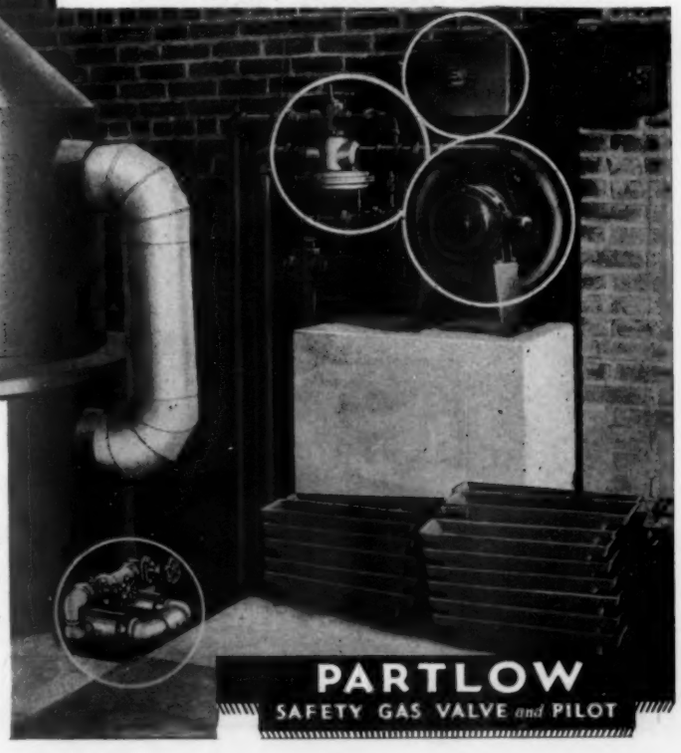


SUPERIOR METER CO.
167-41st Street
Brooklyn, N. Y.

PARTLOW
TEMPERATURE CONTROLS



PARTLOW
AUTOMATIC GAS BURNING EQUIPMENT
Saves Labor . . Minimizes Waste
Eliminates Danger of Cracked Pots
Is Easily Applied . . Speedy in Melting . . Low in Price



Soft Metal Furnace

. . . When the desired temperature is reached with a Partlow equipped Soft Metal Furnace—the gas and air is automatically cut off and the motor stops. Thus saving wear and tear on motor. . . electric current. . . and gas consumption. Overheated metal is eliminated and uniform plates or slugs assured.

Catalog and prices on request.

The PARTLOW CORPORATION
NEW HARTFORD, CONN.

PARTLOW
SAFETY GAS VALVE *and* PILOT

FULTON

BACK PRESSURE REGULATORS

are made to stop the flow of gas in a pipe line when the pressure falls to a point lower than is considered advisable.

Like all Chaplin-Fulton equipment they can be depended upon for accurate and reliable service. Forty-five years of successful experience in the manufacture of gas and steam regulators make us confident we can serve you to advantage.

Write for catalogue.

CF

The Chaplin-Fulton Mfg. Co.

28-40 Penn Ave. Pittsburgh, Pa.

TRADE CATALOGS

Published by manufacturers of Gas Equipment and Appliances for you. Order by number, using coupon on Page 96.

PLANT EQUIPMENT

A. B. C. SELF CLINKERING GENERATOR
The Western Gas Construction Co. 88
ADVANTAGES OF WELDED CONSTRUCTION
Western Gas Construction Co. 451
AGATHON ALLOY STEELS
Republic Steel Corpn. 626
"AMERICAN" GAS AND METER TESTING APPARATUS
American Meter Co. 320
AUTOMATIC GOVERNORS
Connelly Iron Sponge & Governor Co. 289
BALANCE GOVERNORS
Connelly Iron Sponge & Governor Co. 290
BACK PRESSURE VALVES
Connelly Iron Sponge & Governor Co. 295
BECKER TYPE COMBUSTION COKE & GAS OVENS
The Koppers Construction Co. 235
BECKER TYPE BY-PRODUCT COKE AND GAS PLANTS
The Koppers Construction Co. 477
B. H. CO. THICKENER
The Bartlett Hayward Co. 56
B. H. CO. VERTICAL SCRUBBER
The Bartlett Hayward Co. 57
BLAST GATE
Western Gas Construction Co. 580
BOILER FEED PUMPS
P. M. Lattner Mfg. Co. 478
"BULLETS"—HOLDERS
Stacey Bros. Gas Construction Co. 516
BUTTERFLY VALVES
Western Gas Construction Co. 450
BUTANE PLANT EQUIPMENT
Philfuels Co. 510
BUTANE GAS PLANT CONTROL
Cutler Hammer, Inc.
CALORIMETRY
American Meter Co. 321
CALOROPTIC, THE
Connelly Iron Sponge & Governor Co. 511
CHEMICAL ANALYSIS OF GAS PURIFYING MATERIALS
E. J. Lavino & Co. 455
CHEMISTRY AND PHYSICS OF THE COMBUSTION OF GASEOUS FUELS
E. J. Lavino & Co. 456
COAL PRODUCTS TREE
The Koppers Construction Co. 234
COKE FIRED GAS PRODUCER OPERATION
The Koppers Construction Co. 236
CONNELLY COMBINATION VALVE
Connelly Iron Sponge & Governor Co. 610
CONTINUOUS VERTICAL COMBINATION OVENS
The Koppers Construction Company 238
CONTROL MECHANICAL APPARATUS
Western Gas Construction Co. 581
COOPER-BESSEMER NEW TYPE COMPRESSOR UNIT
Cooper-Bessemer Co. 517
COOPER-BESSEMER VERTICAL GAS ENGINES
Cooper-Bessemer Co. 518
COOPER-BESSEMER GAS AND OIL ENGINES
Cooper-Bessemer Co. 519
COOPER COMPRESSOR UNIT
Cooper Bessemer Co. 520
CORRUGATED TRANSITE
Johns-Manville 601
COUNTER BALANCE MANHOLES
Connelly Iron Sponge & Governor Co. 299
DECOMPOSITION METERS
Western Gas Construction Co. 582
DE FLOREZ REMOTE MANUAL CONTROL SYSTEM
Brown Instrument Co. 452
DEHYDRATION OF MANUFACTURED GAS
Western Gas Construction Co. 583
The Koppers Construction Co. 237
DISTRICT L. C. GOVERNORS
Connelly Iron Sponge & Governor Co. 293
DR. OTT-LUX-GAS TESTER
The Alpha Lux Co., Inc. 23
DUPLEX VALVES
Andale Co. 45
FAST & DURABLE COUPLING
The Bartlett Hayward Co 54
FOGGERS OIL
Western Gas Construction Co. 584
FORGED STEEL GATE VALVES
Darling Valve & Mfg. Co 20
FULTON DEAD WEIGHT SAFETY VALVES
Chaplin-Fulton Mfg. Co. 480
FULTON LEVER SAFETY VALVES
Chaplin-Fulton Mfg. Co. 479
GAS CONDENSERS
Isbell Porter Co. 140
GAS COOLER
Andale Co 46
GAS DISTRIBUTION
The U. G. I. Contracting Co. 76
GAS ENGINE DRIVEN COMPRESSOR UNITS
Cooper-Bessemer Corpn. 503
GAS FILTERS
American Meter Co. 322
GAS PURIFICATION PROCESS
Western Gas Construction Co. 585
GAS HOLDERS—HIGH AND LOW PRESSURE
Stacey Mfg. Co. 579
GAS MEASUREMENT
American Meter Co. 323
GATE VALVES
Western Gas Construction Co. 586
GAS WORKS APPARATUS AND EQUIPMENT
Connelly Iron Sponge & Governor Co. 627
HAND COLORIMETER
The Alpha Lux Co. Inc. 22
HIGH EFFICIENCY GAS CONDENSERS
Isbell Porter Co. 137
HIGH PRESSURE TOWER
Western Gas Construction Co. 587
HOWARD CHARGER
The Western Gas Construction Co. 37
HIGH TEST WELDING ROD
Union Carbide & Carbon Corpn. 255
HIGH PRESSURE GAS HOLDERS
Western Gas Construction Co. 590
JET PHOTOMETERS
Connelly Iron Sponge & Governor Co. 292
JOHNS-MANVILL SERVICE TO THE POWER PLANT
Johns-Manville 602
KEEPING UP WITH INDUSTRY
Cruse Kemper Co. 457
KENNEDY AUTOMATIC CONTROL
The Bartlett Hayward Co. 55
KOPPERS COMPANY'S COAL GAS PLANTS, THE
The Koppers Construction Co. 240
LABORATORY APPARATUS
American Meter Co. 324
Superior Meter Co. 521
LIQUID PURIFICATION
The Western Gas Construction Co. 83
LUX RECORDING GAUGE
The Alpha Lux Co., Inc. 21
MACKENZIE EXHAUSTERS
Isbell Porter Co. 141
MANUAL OF DRY BOX PURIFICATION
E. J. Lavino and Co. 274
MERCURY SEAL GOVERNORS
Connelly Iron Sponge & Governor Co. 291
METERS, GAS
American Meter Co. 326
Superior Meter Co. 522
"METRIC" IRONCASE METERS
American Meter Co. 325
MITCHELL ELECTRIC VIBRATING SCREENS
C. W. Hunt Co., Inc. 229
NAPHTHALENE ABSORPTION PLANTS
The Western Gas Construction Co. 84
NEW APPARATUS FOR THE REMOVAL OF NAPHTHALENE AND GUM FORMING CONSTITUENTS FROM GAS
The Koppers Construction Co 241

(Continued on page 92)

"The ELECTROLUX has put romance and drama into the gas industry"

says

MR. C. N. LAUER, *President*
Philadelphia Gas Works Company

"THE GAS REFRIGERATOR has done what no other appliance could do during the last ten years," claims Mr. C. N. Lauer, President of the Philadelphia Gas Works Company. "For no other application of gas carries the romance, the interest, the news-value of freezing with heat.

"In addition, every installation is a good-will builder and gives the gas company an opportunity to demonstrate its willingness and ability to render service to the public."

People today want the newest in everything. Is there anything more modern than gas refrigeration? This idea that gas refrigeration is the latest and best helps people believe other gas appliances are the latest and best, too—leads logically to the all-gas home. That's why so many gas officials regard every Electrolux as an ambassador of good-will.

Getting these good-will builders on your lines is made a lot easier when you use the carefully worked out plans, catalogues and newspaper announcements which are available for the asking. For worth-while co-operation, write to Electrolux Refrigerator Sales, Inc., Evansville, Indiana.

A tiny gas flame takes the place of all moving parts

ELECTROLUX
THE *Gas* REFRIGERATOR

LATTNER

Industrial Gas
BOILERS

Recently Patented

THE H. E. FLUELESS

No flues—No tubes—No coils

Revolutionary in Construction

¾-1 H.P. 1½ H.P. 2 H.P. 3 H.P. 4 H.P. 5 H.P.

"No tubes but equal efficiency"

P. M. LATTNER MFG. CO.
Cedar Rapids, Iowa

STAT-AMATIC

has a
THERMOSTAT
shifted by a
MOTOR-WOUND CLOCK!

Stat-Amatic AUTOMATICALLY shifts from "day" to "night" temperature and vice versa. It also provides lower "Night" temperature hold-over for week end or holiday. The motor-wound clock does away with the necessity of winding. When Stat-Amatic is once installed it can be forgotten.

SEND THIS TODAY—

Stat-Amatic Instrument & Appliance Company
Hartford, Conn. GJ. 3

We want more information about Stat-Amatic for Gas Furnaces.

company .....

individual ..... title

address .....

TRADE CATALOGS

(Continued from page 86)

NEW AND IMPROVED COOPER GAS ENGINE COMPRESSOR
Cooper Bessemer Corpn. 523
NEW METHOD OF GAS PURIFICATION
The Koppers Construction Co. 241
OBSERVATION ON LUX-MATERIAL
The Alpha Lux Co., Inc. 24
ORIFICE METERS
American Meter Co. 327
PIPE—TONCAN IRON
Republic Steel Corp. 454
PRESSURE GAUGES
Connelly Iron Sponge & Governor Co. 296
American Meter Co. 378
Superior Meter Co. 525
PURIFICATION OF OPEN HEARTH FUEL GAS, THE
The Koppers Construction Co. 239
PURIFICATION OF NATURAL GAS & REFINERY GASES FROM HYDROGEN SULPHIDE
Western Gas Construction Co. 588
RELIANCE SERVICE REGULATORS
Isbell Porter Co. 139
ROADLESS BARROWS
Isbell Porter Co. 133
ROTARY SELF-CLEANING STRAINER
Andale Co. 47
SERVICE CLEANERS
American Meter Co. 329
Superior Meter Co. 521
SERVICE GOVERNORS
Connelly Iron Sponge & Governor Co. 292
SERVICE D. C. GOVERNORS
Connelly Iron Sponge & Governor Co. 294
SHAVING SCRUBBERS
Isbell Porter Co. 138
SHEET IRON A PRIMER
Republic Steel Corpn. 628
SMOOT CONTROL OF COMBUSTION AS APPLIED TO TRAVELING GRATE STOKERS
Smoot Engineering Corpn. 69
SMOOT CONTROL AS APPLIED TO UNDERFEED STOKERS
Smoot Engineering Corpn. 67
SMOOT CONTROL AS APPLIED TO WATER GAS SETS
Smoot Engineering Corpn. 68
SMOOT STEAM ACCUMULATOR AND CONTROL SYSTEM
Smoot Engineering Corpn. 66
SPECIFICATIONS ON HIGH AND LOW PRESSURE HOLDERS
The Stacey Bros. Gas Constrn. Co. 74
"STACEY BULLET"
The Stacey Bros. Gas Constrn. Co. 73
STANDARD HOLDERS FOR LOW PRESSURE STORAGE
Western Gas Construction Co. 580
STREET DEPARTMENT TOOLS
Connelly Iron Sponge & Governor Co. 297
STREET MAIN GOVERNORS
Isbell Porter Co. 134
THROTTLE GOVERNORS & COMPENSATORS
Isbell Porter Co. 142
U. G. I. BARRING DOWN MACHINE, THE
The U. G. I. Contracting Co. 77
U. G. I. INTERMITTENT CHAMBER OVENS
The U. G. I. Contracting Co. 75
U. G. I. MECHANICAL GENERATOR AND CHARGER, THE
The U. G. I. Contracting Co. 79
U. G. I. MODEL "B" AUTOMATIC CONTROL, THE
The U. G. I. Contracting Co. 71
VALVES
The Western Gas Construction Co. 86
VALVES & SPECIALS
Isbell Porter Co. 144
VALVES
Darling Valve & Mfg. Co. 35
VERTICAL GAS ENGINES
Cooper-Bessemer Corpn. 504
WATER GAS
The Western Gas Construction Co. 89
WATERLESS GAS HOLDERS
The Bartlett Haynard Co. 58
WEST GAS
West Gas Improvement Co. 175
POSITIVE PRESSURE BLOWERS
The Connersville Blower Co. 61
PUMPS FOR GAS PLANTS
Geo. D. Roper Corpn. 481
ROOTS ACME GAS PUMPS
The P. H. & F. M. Roots Co. 212
ROOTS ACME GAS PUMP INSTRUCTIONS AND PARTS LIST
The P. H. & F. M. Roots Co. 211
ROOTS GAS PUMP INSTRUCTIONS AND PARTS LISTS
The P. H. & F. M. Roots Co. 213
ROOTS POSITIVE DISPLACEMENT METER
The P. H. & F. M. Roots Co. 209
ROTARY DISPLACEMENT METERS
The Connersville Blower Co. 59
ROOTS ROLLER BEARING GAS PUMPS
P. H. & F. M. Roots Mfg. Co. 477
ROOTS ROLLER BEARING BLOWERS, STANDARD DUTY, HEAVY DUTY
P. H. & F. M. Roots Co. 453
STANDARD DUTY GAS PUMP CONSTRUCTION
The P. H. & F. M. Roots Co. 216
STANDARD HOLDERS FOR LOW PRESSURE STORAGE
Stacey Mfg. Co. 424
HIGH PRESSURE GAS HOLDERS
Stacey Mfg. Co. 425

INSTRUMENTS

BRISTOL'S AIR OPERATED CONTROLLERS
The Bristol Co. 125
BRISTOL'S AUTOMATIC ELECTRIC CONTROL VALVES
The Bristol Co. 126
BROWN AUTOMATIC TEMPERATURE CONTROL CATALOG
The Brown Instrument Co. 166
BROWN ELECTRIC FLOW METER CATALOG
The Brown Instrument Co. 170
BROWN REMOTE TYPE INSTRUMENTS
Brown Instrument Co. 427
BRISTOL AUTOMATIC TEMPERATURE CONTROL CATALOG ON GAS FIRED BAKING OVENS
Bristol Co. 492
BRISTOL'S LONG DISTANCE TRANSMITTING GAUGES
The Bristol Co. 129
BRISTOL'S PYROMETERS
The Bristol Co. 130
BROWN PYROMETER CATALOG
The Brown Instrument Co. 171
BRISTOLS PYROMETER CONTROLLERS
The Bristol Co. 123
BRISTOLS RECORDING BAROMETERS
The Bristol Co. 125
BRISTOL'S RECORDING LIQUID LEVEL GAUGES
The Bristol Co. 128
BRISTOL'S RECORDING MILLIVOLTMETERS FOR ELECTROLYSIS SURVEYS
The Bristol Co. 127
BRISTOL'S RECORDING PRESSURE & VACUUM GAUGES
The Bristol Co. 132
BRISTOL RECORDING PSYCHROMETERS
The Bristol Co. 308
BRISTOL'S TEMPERATURE CONTROLLERS
The Bristol Co. 124
BRISTOL'S RECORDING THERMOMETERS
The Bristol Company 132
THE ERA OF AUTOMATIC CONTROL
Brown Instrument Co. 502
"GOOD FURNACES—GOOD MEN—YET WE'RE SUNK ON OUR HEAT TREATING COSTS"
Brown Instrument Co. 550
MEETING YOUR IDEAS ON THE FLOW PROBLEM
The Brown Instrument Co. 164
PARTLOW TEMPERATURE CONTROLS
Partlow Corpn. 482
PRESSURE GAUGE CATALOG
The Brown Instrument Co. 169
RECORDING DEMAND FOR GAS METERS
American Meter Co. 330
RECORDING THERMOMETERS CATALOG
The Brown Instruments Co. 168
RESISTANCE THERMOMETERS CATALOG
The Brown Instrument Co. 167
TYCOS INSTRUMENTS FOR GAS PLANTS
Taylor Instrument Companies 542

REGULATORS

AUTOMATIC GAS BURNING EQUIPMENT
Partlow Corpn. 470
AUTOMATIC TEMPERATURE CONTROLS
Partlow Corpn. 471

(Continued on page 90)

PUT THE PUNCH behind your GAS burner sales NOW!

THE fall selling season is fast approaching. Most gas companies have well laid plans for gas burner merchandising, during the fall months.

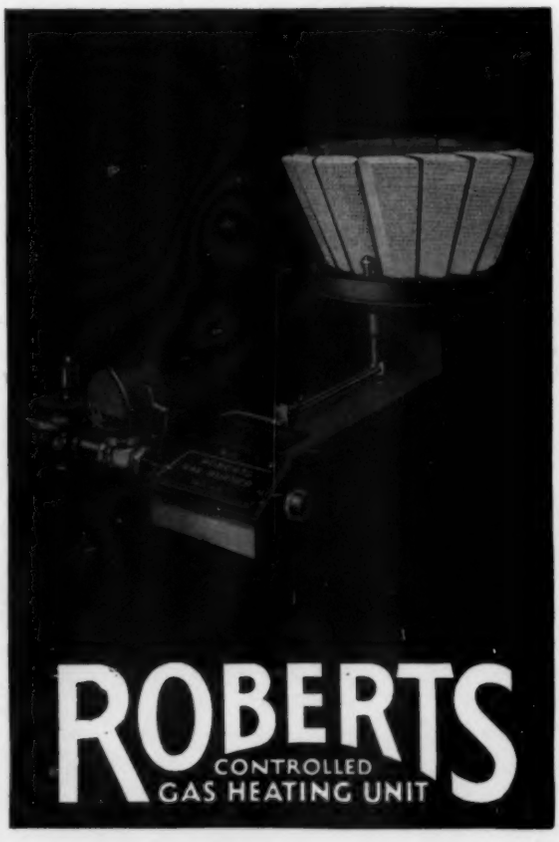
Now is the time to put the punch behind these plans and campaign on your live prospects.

Let Roberts-Gordon help you. We have developed a complete sales and advertising program, which is now proving successful in many gas companies. Full information will be sent gratis.

But start now. The fall selling season is fast approaching. No time should be lost.

ROBERTS-GORDON
APPLIANCE CORPORATION
CURTISS BLDG. BUFFALO, N. Y.

Heat YOUR HOME with Gas



GROBLE
REGULATORS & GOVERNORS

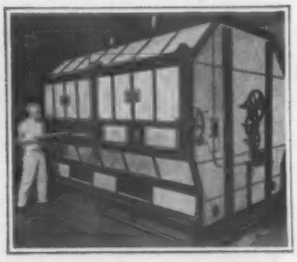
Complete line of Regulators for

NATURAL
MANUFACTURED
BUTANE
PROPANE
GASES

HANDY INDICATOR for determining correct orifice size of service regulators according to inlet pressure mailed upon request.

GROBLE GAS REGULATOR COMPANY
Office and Factory—Anderson, Indiana

Bakers Make Good Gas Customers With This McDonald Made Meek Reel Oven



The bakers in your community all should be using gas as fuel. If they are not, perhaps it is because their ovens are not modern—not equipped to burn gas efficiently and economically. Every baker, once acquainted with the fuel economy of McDonald Made Meek Reel ovens is a live prospect for you. Write us for complete information on this modern baker's oven.

THE BRUCE McDONALD CO.
2015 WASHINGTON STREET
KANSAS CITY, MO.

TRADE CATALOGS

(*Continued from page 88*)

AUTOMATIC TEMPERATURE INDICATING CONTACTOR
Partlow Corpn. 472
AUTOMATIC TRUCK-CLOSING ANTI-VACUUM VALVE
Reynolds Gas Regulator Co. 282
BARBER SUPERIOR GAS PRESSURE REGULATORS
The Barber Gas Burner Co. 604
BOTTLED GAS AN ALLY OF THE GAS INDUSTRY
Sprague Meter Co. 306
FULTON GAS FUEL BOILER GOVERNOR
The Chaplin Fulton Mfg. Co. 248
FULTON GAS REGULATOR CATALOGUE
The Chaplin Fulton Mfg. Co. 247
HIGH PRESSURE LINE REGULATORS AND HIGH PRESSURE RELIEF VALVES
Reynolds Gas Regulator Co. 278
HIGH PRESSURE SERVICE REGULATORS
Reynolds Gas Regulator Co. 279
LINOTYPE AND MONOTYPE TEMPERATURE CONTROL
Partlow Corpn. 473
LITTLE GIANT HOUSE REGULATOR
Reynolds Gas Regulator Co. 283
LOW PRESSURE SERVICE REGULATORS
Reynolds Gas Regulator Co. 281
METAL MELTING POT TEMPERATURE CONTROL CIRCULAR
Partlow Corpn. 474
METER HANGER CATALOG
Mueller Co. 2
PERFORMANCE IS PROOF
Groble Gas Regulator Co. 175
POCKET HAND BOOK—DIRECTIONS FOR SETTING AND OPERATING FULTON GAS REGULATORS
The Chaplin Fulton Mfg. Co. 249
REGULATOR CATALOG
Mueller Co. 3
REGULATOR CATALOG
Reynolds Gas Regulator Co. 37
REGULATORS FOR HIGH & MEDIUM PRESSURES
Sprague Meter Co. 225
RELIANCE BALANCE VALVE DISTRICT REGULATOR
Isbell Porter Co. 135
SINGLE DISTRICT & DOUBLE DISTRICT REGULATORS
Isbell Porter Co. 136
Reynolds Gas Regulator Co. 280
SAFETY GAS VALVE AND PILOT WITH LOW WATER SHUT OFF
Partlow Corpn. 475
SINGLE- DOUBLE- AND QUADRUPLET SAFETY GAS VALVE AND PILOT
Partlow Corpn. 476
FULTON HOUSE REGULATOR
FULTON SPRING REGULATOR
FULTON VACUUM RELIEF VALVES
FULTON DIFFERENTIAL RELIEF VALVES
FULTON DIFFERENTIAL REGULATORS
FULTON DIFFERENTIAL GAS RELIEF VALVES
FULTON BLOWGAS REGULATORS
FULTON LEVER SAFETY VALVES
FULTON DUPLEX VACUUM OR BACK PRESSURE REGULATOR
FULTON BACK PRESSURE REGULATORS
FULTON THROTTLING REGULATORS
FULTON COMPRESSOR REGULATORS
FULTON HIGH PRESSURE REGULATORS
FULTON LOW PRESSURE REGULATORS
FULTON CUTOUT LATCH REGULATOR
FULTON DEAD WEIGHT REGULATOR
FULTON DUPLEX SENSITIVE GAS GOVERNOR
The Chaplin Fulton Mfg. Co. 611

REFRACTORIES

CEMENTING JAMP JOINTS
Quigley Company 154
CHOOSING A HIGH TEMPERATURE CEMENT
HIGH TEMPERATURE CEMENT IN THE GAS PLANT
Quigley Company 158
HOT PATCHING RETORTS
Quigley Company 160
HYTEMPITE IN THE GAS PLANT
Quigley Company 163
HYTEMPITE IN THE POWER PLANT
Quigley Company 408
PROTECT YOUR PLANT & EQUIPMENT —A PROTECTIVE COATING
Quigley Company 161
PROPERTIES AND USES OF KROMEPATCH
E. J. Lavino & Co. 458
QUICK CARBURETOR REPAIRS MADE HYTEMPITE
Quigley Company 157
QUIGLEY REFRACTORY GUN, THE
Quigley Company 162
QUIGLEY ACID PROOF CEMENT
Quigley Company 310

PIPE

AUTOGENOUS WELDING OF NATIONAL PIPE
National Tube Co. 411
BELL & SPIGOT REPAIR CLAMPS
S. R. Dresser Mfg. Co. 612
CAST IRON PIPE
United States Cast Iron Pipe & Foundry Co. 149
CAST IRON PIPE & FITTINGS
McWane Cast Iron Pipe Co. 203
COUPLINGS AND SPECIALTIES FOR NATURAL GAS
S. R. Dresser Mfg. Co. 43
COUPLINGS FOR MANUFACTURED GAS MAINS
S. R. Dresser Mfg. Co. 42
COUPLINGS FOR PLAIN END PIPE
S. R. Dresser Mfg. Co. 613
FOR EVERY JOINT ON THE LINE
Victaulic Co. of Amer. 13
WESTLING VALVE
Bartlett Hayward Co. 275
WOODALL-DUCKHAM VERTICAL RETORTS
Isbell Porter Co. 143
PIPE CATALOG, GENERAL
McWane Cast Iron Pipe Co. 483
SMALL PIPE CATALOG
McWane Cast Iron Pipe Co. 484
HANDBOOK OF CAST IRON PIPE (DISTRIBUTED TO GAS OFFICIALS AND ENGINEERS ONLY)
Cast Iron Pipe Research Assn. 178
HANDBOOK OF CAST IRON PIPE FOR GAS SERVICE
United States Cast Iron Pipe & Foundry Co. 148
HANDBOOK OF DE LAVAUD CENTRIFUGALLY CAST IRON PIPE
United States Cast Iron Pipe and Foundry Co. 144
SAFEGUARDING YOUR PIPE LINE INVESTMENT
Johns Manville
SEMET SOLVAY PIPING AND VALVES
Semet Solvay Engineering Corpn. 614
TONCAN IRON PIPE FOR PERMANENCE
Republic Steel Corpn. 629

BLOWERS

CONNERSVILLE GAS EXHAUSTERS, BOOSTERS AND METERS
The Connersville Blower Co. 60
CONNERSVILLE POSITIVE PRESSURE BLOWER
The Connersville Blower Co. 332
CONNERSVILLE CYCLOIDAL PUMPS
The Connersville Blower Co. 333
COVERS INDUSTRY LIKE A BLANKET
The P. H. & M. M. Roots Co. 218

PIPE (Coatings, Couplings, Joints, Welding Equipment)

JOINTS ON DE LAVAUD CAST IRON PIPE FOR GAS SERVICE
United States Cast Iron Pipe and Foundry Co. 147
"FOR EVERY JOINT ON THE LINE"
Victaulic Co. 499
PIPE COUPLINGS
Victaulic Co. of Amer. 14
STEEL PIPE COUPLINGS
S. R. Dresser Mfg. Co. 41
STREET DEPARTMENT SUPPLIES
Safety Gas Main Stopper Co. 261
HIGH TEST WELDING ROD
The Linde Air Products Co. 82
JOINT SEALING COMPOUND
Quigley Company, Inc. 485
LONG PIPE LINES WITH OXWELDED JOINTS
The Linde Air Products Co. 81
OXWELD
The Linde Air Products Co. 81
OXY-ACETYLENE TIPS
The Linde Air Products Co. 80

(*Continued on page 92*)

JOHNSON JUNIOR

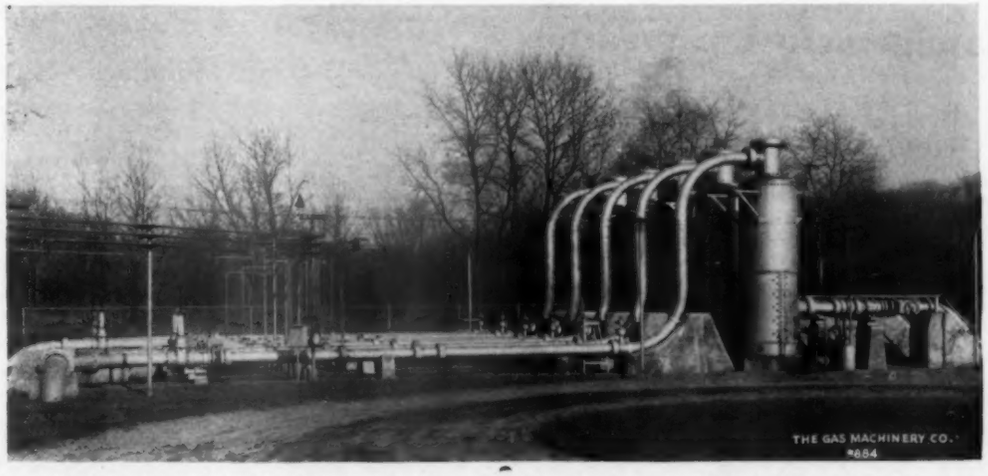
EASY TO BUY
EASY TO SELL

The Johnson Junior with its low initial cost—low operating cost—amazing efficiency and dependability is easily within the means of a great group of gas home heating prospects; and they are accepting it because they *can* afford it. Anything that's easy to buy is easy to sell. Get the facts on the Johnson Junior today—they're interesting.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids JOHNSON PATENTED DIRECT JET **IOWA**

DUST SEPARATORS FOR NATURAL GAS LINES

Prevent—Clogging of lines, fittings, burners and pilot lights; Cutting of regulator valves; Stoppage of positive and orifice meters; Wear of compressor valves, rings and liners; Interference in gasoline plant operation.



PLANT WITH FIVE DUST SEPARATORS AND METERING EQUIPMENT. RATED CAPACITY 125,000,000 CU. FT. DAILY

The dust originates from well sand, construction dirt and pipe corrosion.
Complete Dust Separating Plant consists of—Dust Separators; Bypass valves and connections; Oil handling, reclaiming and pumping equipment.

THE GAS MACHINERY COMPANY **CLEVELAND, OHIO**

HYTEMPITE

is the universally used high - temperature cement for Gas Plants, because it

—insures quick, economical repairs of Retorts, Jamb Joints, Furnace Walls, Arches and Baffles.

—can be used with salvaged, crushed old fire brick.

—not affected by heating and cooling of ovens.

—stands up under severe weather conditions.

—makes thin, strong joint between tile or brick that stands up under extreme abrasive action of clinker tools.

—easily shot into place with Quigley Refractory Gun.

Keep a drum of HYTEMPITE in Retort House or Boiler Room for quick repairs.

QUIGLEY COMPANY INC.
INDUSTRIAL SPECIALTIES
56 West 45th Street, New York
Distributors with Stock and Service in every Industrial Center

Byllesby Engineering and Management Corporation

Wholly-owned subsidiary of

Standard Gas and Electric Company

231 South La Salle Street, Chicago

New York Pittsburgh San Francisco

TRADE CATALOGS

(*Continued from page 90*)

METERS

APPARATUS BULLETINS
American Meter Co. 119
CAST IRON GAS METERS
Sprague Meter Co. 284
DISPLACEMENT AND ORIFICE MEASEMCO STANDARD DOMESTIC AND CURB BOX METERS
Pittsburgh Equitable Meter 416
EMCO TIN METER
Pittsburgh Equitable Meter Co. 268
EMCO NO. 5 LARGE CAPACITY PRESSED STEEL GAS METER
Pittsburgh Equitable Meter Co. 269
EMCO DEMAND METER
Pittsburgh Equitable Meter Co 266
EMCO LARGE CAPACITY POSITIVE GAS METERS
Pittsburgh Equitable Meter Co. 266
MONEL WET TYPE METERS
Superior Meter Co. 223
INSTRUCTIONS FOR CONNERSVILLE TANDEM METERS
The Connersville Blower Co. 337
INSTRUCTION FOR THE INSTALLATION AND OPERATION OF CONNERSVILLE ROTARY DISPLACEMENT METERS
Connersville Blower Co. 341
INSTRUCTIONS FOR THE MAXIMUM DEMAND RECORDER
The Connersville Blower Co. 336
INSTRUCTIONS FOR THE USE OF THE P. U. T. T. RECORDING GAUGE
The Connersville Blower Co. 342
IRONCLAD CAST IRON DRY GAS METER
Pittsburgh Equitable Meter Co. 264
DREADNAUGHT TYPE METERS
Sprague Meter Co. 227
GAS METERS AND APPARATUS
Lambert Meter Co., Inc. 173
American Meter Co. 338
Superior Meter Co. 527
INSTRUCTIONS FOR THE PROVING AND TESTING OF METERS
American Meter Co. 120
Superior Meter Co. 528
LINDERMAN LARGE VOLUME GAS METERS
American Meter Co. 339
METER CATALOG
American Meter Co. 121
METERS AND DIAPHRAGMS
Superior Meter Co. 224
"METRIC" FLOW METERS
American Meter Co. 343
RECORDING DEMAND FLOWMETER
Lambert Meter Co. 172
DEMAND GAS METERS
Bulletin 13—Sprague Meter Co. 303
"WESTCOTT" ORIFICE METERS
American Meter Co. 344
SPRAGE LINE OF LOW PRESSURE REGULATORS
Sprague Meter Co. 488
RECHROME AND OILED METER LEATHERS
Besse Osborne & Odell 570

MISCELLANEOUS

CLEVELAND TRENCHERS
Cleveland Trencher Co. 417
ADJUSTABLE CYLINDER METER HANGERS
Mueller Co. 489
CLEANING COMPOUND ANNITE
Quigley Co., Inc. 490
BITUMEN HEATERS
Mohawk Asphalt Heater Co. 571
LEAD & COMPOUND MELTING FURNACES
Mohawk Asphalt Heater Co. 572
PIPE DIPPING TROUGHS
Mohawk Asphalt Heater Co. 573
OIL BURNING TORCHES
Mohawk Asphalt Heater Co. 574
COMBINATION TOOL ASPHALT & SURFACE HEATERS
Mohawk Asphalt Heater Co. 575
KROMEPATCH IS USED IN ALL INDUSTRIES
E. J. Lavino & Co. 615
MOHAWK HI-SPEED TRADER TOOL CHART
Mohawk Asphalt Heater Co. 576
MOHAWK HI-SPEED UTILITY TRAILERS, 2 AND 4 WHEEL
Mohawk Asphalt Heater Co. 577
CORK DIPPING PANS
Mohawk Asphalt Heater Co. 578
STREET DEPARTMENT SUPPLIES
Safety Gas Main Stopper Co. 616
GOODMAN CYLINDRICAL STOPPERS
Safety Gas Main Stopper Co. 617
GOODMAN GAS MAIN STOPPERS
Safety Gas Main Stopper Co. 618
GAS MAIN BAGS
Safety Gas Main Stopper Co. 619
SAFETY SERVICE PLUGS
Safety Gas Main Stopper Co. 620
PIPE CLEANING BRUSHES
Safety Gas Main Stopper Co. 620
GARDNER-GOODMAN STOPPER
Safety Gas Main Stopper Co. 621

Gas Appliances

INDUSTRIAL EQUIPMENT

AIR HEATER BULLETIN
Surface Combustion Co. 505
RIVET HEATERS
Surface Combustion Co. 506
POTATO CHIP FURNACES
Surface Combustion Co. 507
LAVA TIPS FOR INDUSTRIAL GAS BURNERS
American Lava Corpn. 486
LAVA GAS TIPS AND BURNERS FOR INDUSTRIAL HEATING
American Lava Corpn. 582
AUTOMATIC BOILER FEED SYSTEMS
P. M. Lattner Mfg. Co. 287
FURNACES, TORCHES, BURNERS FOR HEATING, SOLDERING, METAL-MELTING, HEAT TREATING
Johnson Gas Appliance Co. 526
GAS FIRED HGH PRESSURE BOILERS
P. M. Lattner Mfg. Co. 286
PROFITABLE BAKING
Bruce McDonald Co. 39
THE RED DEVIL OVEN
Bruce McDonald Co. 38
LINOTYPE TEMPERATURE CONTROL
Robertshaw Thermostat Co. 418
LAVA FOR MECHANICAL AND ELECTRICAL PURPOSES
American Lava Corpn. 487
MANTLE RECUPERATORS
Surface Combustion Co. 515
NEW PROCESS OF NITRIDING
Surface Combustion Co. 508
MONOTYPE TEMPERATURE CONTROL
Robertshaw Thermostat Co. 419
METAL MELTING POT TEMPERATURE CONTROLLER
Robertshaw Thermostat Co. 420
MOTION IN BAKING
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Johnson Gas Appliance Co. 554
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JOHNSON INDUSTRIAL GAS APPLIANCES
Johnson Gas Appliance Co. 531

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American Gas Products Corpn. 246
AUTOMATIC UNIFORM HEAT
Roberts-Gordon Appliances Corpn. 551
BOILER TRADE CATALOG
American Gas Products Corpn. 245
BOILER CONSUMER CATALOG
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Barber Gas Burner Co. 469
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(*Continued on page 94*)

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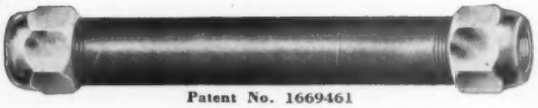

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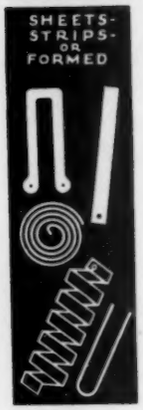

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SALES ALBUM
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GAS RANGES
American Stove Co. 253

ADVERTISING MANUAL
George D. Roper Co. 48

MERCHANDISING GAS APPLIANCES TO THE HOUSEWIFE
Geo. D. Roper Corpn. 49

RANGE CATALOG
Geo. D. Roper Corpn. 51

RANGE CATALOG
New Process Stove Co. 260

RANGE CATALOG
Dangler Stove Co. 261

RANGE CATALOG—ORIOLE GAS RANGES
Standard Gas Equipment Corpn. 346

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American Lava Corpn. 36

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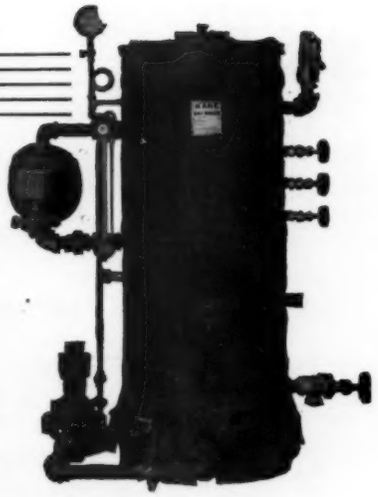

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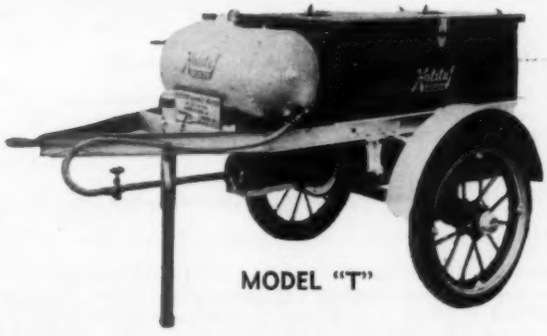

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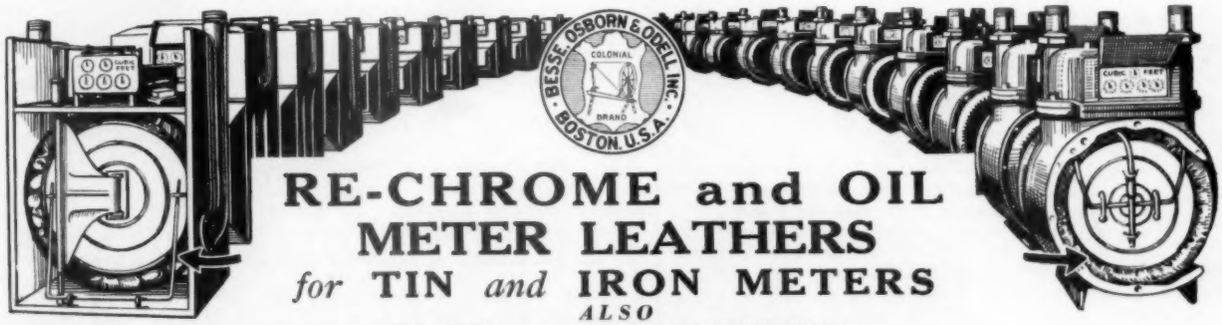

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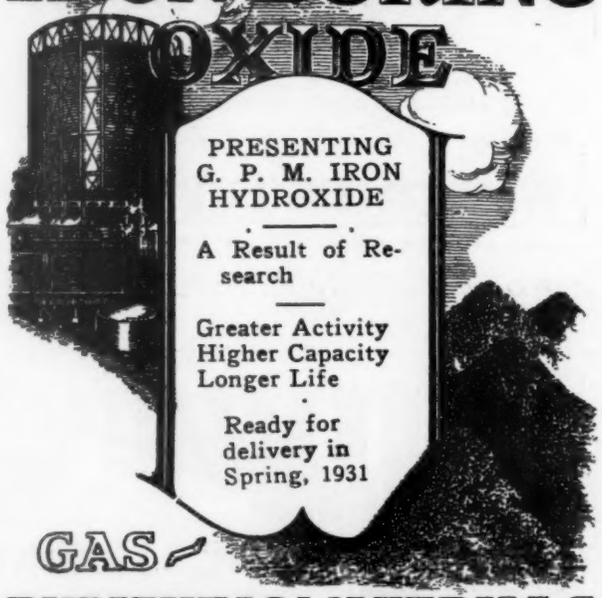

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Electrolux Refrigerator Sales, Inc. 87
Estate Stove Company, The .....Front Cover

Gas Engineering Co. 100
Gas Machinery Co. 91
Gas Purifying Materials Co. 98
General Ceramics Company 98
General Gas Light Co. 77
Groble Gas Regulator Co. 90

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Improvement Equipment-Russell Engr. Co... 100
International-Stacey Corp. 11-100
Isbell Porter Co. 97

Johnson Gas Appliance Co. 91
Johns-Manville 8

Kompak Company 58

Lambert Meter Co. 93
Lattner Mfg. Co., P. M. 88
Lavino & Co., E. J. 97
Linde Air Products Co. 16
Lovekin Water Heater Co. 79

McClintic-Marshall Co. 94
McDonald Co., Bruce 90
McWane Cast Iron Pipe Co. 21
Mears-Kane-Ofeldt, Inc. 95
Mohawk Asphalt Heater Co. 95
Mueller Co. 14

Partlow Corp., The 85
Patrol Valve Co. 56
Philfuels Company 6
Pittsburgh Equitable Meter Co.....Second Cover
Precision Thermometer & Instrument Co. .. 93

Quigley Co. 92

Republic Steel Corp. .....Third Cover
Reynolds Gas Regulator Co. 15
Roberts-Gordon Appliance Corp. 89
Robertshaw Thermastat Co. 81
Roots Co., P. H. & F. M. 11-100
Roper Corp., Geo. D. 83

Safety Gas Main Stopper Co. 98
Semet-Solvay Engineering Co. 5
Sprague Meter Co. .....Fourth Cover
Stacey Bros. Gas Construction Co. 11-100
Superior Meter Co. 85
Surface Combustion Corporation 71
Stacey Manufacturing Co. 4
Stat-Amatic Instrument & Appliance Co..... 88

Unger, John S. 100
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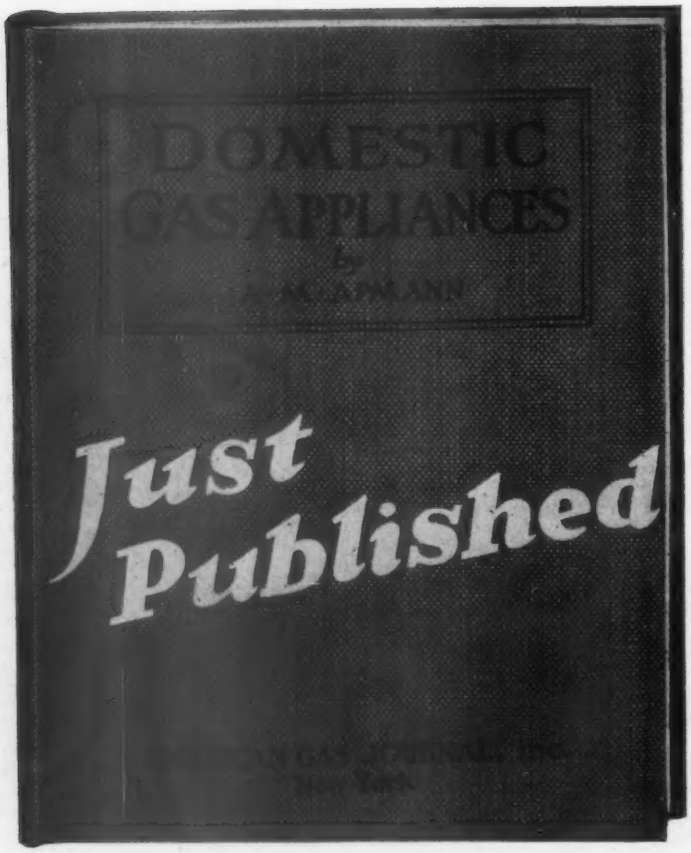

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"To sum up, then, 'Domestic Gas Appliances' is a book the study of which cannot but benefit the gas salesman, whether his country be America or Great Britain; and although we feel that the salesman in the States will derive the greatest and most immediate value from the book, there is no doubt at all that it would prove most interesting to British gas salesmen. Certainly it is calculated to broaden their vision and eliminate confusion; and there is everything to be said for gaining an understanding of the problems of the Gas Industry in America and the methods employed in their solution. To the English gas salesman the book may give many valuable ideas."

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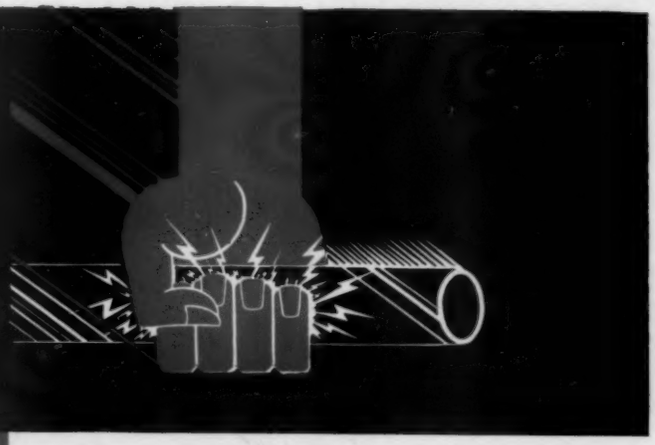

When Ford, Bacon and Davis Construction Corporation received the Arkansas Natural Gas Company contract to construct the new 8-5/8" pipe line between Longview, Texas and Shreveport La., it called for completion of approximately 70 miles in 45 days. Construction was completed in 38 days, and final test made the line available one week earlier than scheduled. Two difficult river crossings delayed the completion of the entire job at least one week.

A well-laid plan, an efficient construction organization and REPUBLIC Electric Weld Pipe made this speed possible. An average of a little better than two miles a day was laid on the main line. Joints were acetylene welded and bends were made on the job without a single buckle. Test at 1000 lbs. proved the soundness of the job, not a leak developing. A rotary scraper was put through the entire line including the river crossings without ever being stopped at bends or welds. This was an amazing performance.

For long lines or short, use REPUBLIC Electric Weld Pipe. Long lengths up to 50 ft. make for speed in line construction. So does the roundness of the pipe and its uniform wall thickness, while uniformity of grain structure assures certainty of either acetylene or arc weld joints.

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